Supply Chain Management in Complex Organisations: A Case Study of JB Marks Local Municipality

by

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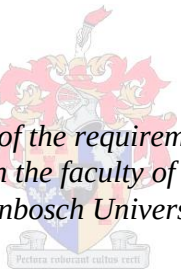

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ABSTRACT

Considering the high levels of demand for accelerated quality service delivery and relating challenges faced by the public sector – in particular municipalities – post-1994, the public sector is required to investigate and address its organisational challenges in order to ensure required efficiencies for service delivery. This research investigates the nature of local government operations to evaluate whether or not local government is, by its nature and operations, a complex organisation. Specific reference is given to JB Marks Local Municipality (JBMLM) and its supply chain management (SCM) functions. The evolutionary phenomenon of the organisation does not exclude public sector organisations, such as local government, which must adapt and evolve in order to survive internal and external environment challenges.

The research reveals that municipalities experience the same challenges as other public sector organisations. Factors external to municipalities impact the functioning of local government as an organisation and the functioning of its SCM units. Therefore, one responsibility of local government should be to ensure an in-depth understanding of its environment, including challenges such as those arising from a lack of adequate legislative framework. All efforts must be made to respond to these challenges to prevent external factors from having a detrimental impact on service delivery in local government. The overall mandate of reviewing local government's legislative framework is aimed at ensuring its resilience and relevance, as this process will enable local government to adopt survival, evolutionary and developmental approaches.

The research investigates SCM practices and determines the effect of complexity on the functioning of organisations such as JBMLM, in particular its supply chain functions, and makes recommendations on how to address these challenges. The study follows a quantitative approach, and data collection is conducted via a self-administered questionnaire. The questionnaire, which was designed based on the literature review, addresses several aspects relating to SCM, complexity and complex organisations.

The purpose of the questionnaire is to determine perceptions, experiences, beliefs and expectations of municipal employees, municipal councillors, a representative from the Office of the Auditor-General and community members, with a view to establish the

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most significant challenges to the optimal functioning of SCM and its associated complexity. In this regard, recommendations are made to empower JBMLM and the general body of local government in South Africa.

Results of the study indicate that local government, as a creature of statute, is a complex organisation with characteristics inherent to all complex organisations. The environment of municipalities characterises a heterogeneity and diversity that impacts on their functioning. The uncertainty, instability, chaos and emergence of new patterns and structural challenges within local government explain its complexity and affects its functioning, including departmental subdivisions, sections and units. The ever-changing local government environment, including the instability within and outside its operating environment, contributes to the volatility, uncertainty, complexity and ambiguity experienced by this sphere of government and affects its total functioning.

SCM is an important factor in and contributor to gross domestic product. Its importance within the internal and external environment of the organisation cannot be overemphasised. The study reveals that a nexus exists between SCM functioning and service delivery within local government and, therefore, failure of SCM has serious implications for municipal service delivery. The results of the study confirm that SCM is influenced by the external environment within which municipalities operate.

Considering complexity in organisations, SCM has become a complex function influenced by various factors such as uncertainty brought about by the internal and external environment. The study reveals that there is a bullwhip effect in the SCM of local government, brought about by the effect of the external environment on the SCM process, such as through reliability of suppliers, actions of competitors, quality of products, demand regarding quantities, timing and increased flexibility requirements. A bullwhip effect refers to a SCM phenomenon wherein changes in demand cause challenges within the whole supply chain network.

The study identifies that the two elements of the supply chain management framework – demand management and acquisition management – are directly incompatible with the complex organisation phenomenon. The study recommends that, in order for SCM to succeed, it must adopt some flexibility in responding to internal and external

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environment challenges. In addition, the study reveals that the regular amendments to the SCM policy directives and legislative framework are indicative of the complexity of SCM as a support and cross-sectional function within the organisation and local government in general.

The literature review indicates that SCM literature is dissimilar to public sector and local government SCM. Public sector SCM aims to ensure total compliance with the prescripts of national government objectives while SCM literature focuses on ensuring efficiency and effectiveness within the supply chain and its processes.

The supply chain has been part of local government since 2005, when the legislative framework on SCM was introduced. The study reveals that after 13 years in local government SCM is still in a developmental phase and requires constant adjustment to its founding legislation in order to ensure it addresses all unanticipated challenges. Local government is therefore required to adopt a survival, evolutionary and developmental approach to ensure that it remains relevant. It must continuously address its challenges, including its complexity as an organisation.

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ABSTRAKTE

Met inagneming van die hoë vraag na versnelde dienslewering van gehalte en die uitdagings wat die openbare sektor, veral munisipaliteite, na 1994 in die gesig staar, moet die openbare sektor sy organisatoriese uitdagings ondersoek en aanpak ten einde die vereiste doeltreffendheid vir dienslewering te verseker. Hierdie navorsing het ondersoek ingestel na die aard van die plaaslike owerheidsbedrywighede met die oog op die evaluering van die vraag of die plaaslike owerheid, uit aard en werking, 'n komplekse organisasie was, met spesifieke verwysing na JB Marks Plaaslike Munisipaliteit (JBMLM) en sy voorsieningskettingbestuur (SCM) -funksies. Die evolusionêre verskynsel van die organisasie sluit nie organisasies in die openbare sektor, soos die plaaslike regering, uit nie, wat moet sorg dat hulle te midde van al hul uitdagings aanpas en ontwikkel om die interne en eksterne omgewingsuitdagings te oorleef.

Die navorsing het aan die lig gebring dat munisipaliteite as organisasies dieselfde uitdagings ervaar as ander organisasies in die openbare sektor. Faktore buite die munisipaliteit beïnvloed die funksionering van die plaaslike regering as 'n organisasie en die werking van die SCM-eenhede. Daarom moet een van die verantwoordelikhede van die plaaslike regering wees om te verseker dat daar 'n diepgaande begrip van die omgewing, insluitend die uitdagings, veral die wat voortspruit uit die gebrek aan voldoende wetgewende raamwerk, bestaan. Daar moet alle pogings aangewend word om te verseker dat hierdie uitdagings aangepak word om te verseker dat eksterne faktore nie 'n nadelige of ernstige uitwerking op dienslewering in die plaaslike regering het nie. Die algemene mandaat om die wetgewende raamwerk te hersien, is daarop gemik om te verseker dat die plaaslike regering veerkragtig en relevant is, aangesien hierdie proses die plaaslike regering in staat stel om oorlewings-, evolusionêre en ontwikkelingsbenaderings aan te wend.

Die navorsing ondersoek die SCM-praktyke en bepaal die effek van kompleksiteit op die funksionering van die organisasie soos JBMLM, veral die voorsieningskettingfunksies, en het probeer om aanbevelings te maak oor hoe hierdie uitdagings aangepak kan word. Die studie het 'n kwantitatiewe benadering gevolg, en data-insameling is gedoen deur middel van 'n self-toegediende vraelys. In die vraelys,

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wat ontwerp is op grond van die literatuuroorsig wat uitgevoer is, is verskeie aspekte rakende SCM, kompleksiteit en komplekse organisasies aangespreek.

Die doel van die vraelys was om die persepsies, ervarings, oortuigings en verwagtinge van munisipale werknemers, munisipale raadslede, 'n verteenwoordiger van die kantoor van die Ouditeur-generaal en lede van die gemeenskap te bepaal, met die doel om die belangrikste uitdagings vir die optimale funksionering van SCM en die gepaardgaande kompleksiteit. In hierdie verband is aanbevelings gedoen om JBMLM en die algemene liggaam van plaaslike regering in Suid-Afrika te bemagtig.

Die resultate van die studie het aangedui dat die plaaslike regering, as wese van wette, 'n komplekse organisasie was met inherente eienskappe wat in alle komplekse organisasies voorkom. Die omgewing van munisipaliteite kenmerk 'n heterogeniteit en diversiteit wat 'n invloed het op die funksionering van munisipaliteite. Die onsekerheid, onstabiliteit, chaos en die ontstaan van nuwe patrone en nuwe strukturele uitdagings binne die plaaslike regering verklaar die kompleksiteit van plaaslike regering as 'n organisasie en beïnvloed die funksionering van die organisasie, insluitend departementele onderafdelings, afdelings en eenhede. Die immer veranderende omgewing van die plaaslike regering, insluitend die onstabiliteit binne en buite sy bedryfsomgewing, dra by tot die wisselvalligheid, onsekerheid, kompleksiteit en dubbelsinnigheid wat hierdie regeringsfeer ervaar en beïnvloed die totale funksionering daarvan.

SCM is 'n belangrike faktor in en dra by tot die bruto binnelandse produk. Die belangrikheid daarvan binne die interne en eksterne omgewing van die organisasie kan nie te veel beklemtoon word nie. Die studie het aan die lig gebring dat daar 'n nexus bestaan tussen SCM-funksionering en dienslewering binne die plaaslike regering, en dat die mislukking van SCM ernstige gevolge vir munisipale dienslewering het. Die resultate van die studie het bevestig dat SCM beïnvloed word deur die eksterne omgewing waarin munisipaliteite funksioneer.

Met inagneming van kompleksiteit in organisasies, het SCM 'n komplekse funksie geword wat beïnvloed is deur verskillende faktore, soos onsekerheid wat deur die interne en eksterne omgewing teweeggebring is. Die studie het aan die lig gebring dat

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daar 'n sogenaamde ossweep (bullwhip) -effek in SCM binne plaaslike regering is wat veroorsaak word deur die uitwerking van die eksterne omgewing op die SCM-proses, soos betroubaarheid van verskaffers, optrede van mededingers, kwaliteit van die produkte, vraag na hoeveelhede, tydsberekening en verhoogde buigsaamheid vereistes. ‘n Bullwhip-effek verwys na 'n SCM-verskynsel waarin veranderinge in die vraag uitdagings in die hele verskaffingskettingnetwerk veroorsaak.

SCM in munisipaliteite word beïnvloed deur die kompleksiteite en die wisselvallige, onsekere, komplekse en dubbelsinnige interne en eksterne omgewing. In hierdie opsig is die mark waarin SCM sy goedere en dienste verkry, onseker en hoogs wisselvallig en beïnvloed dit die funksionering en doeltreffendheid van die voorsieningskettingbestuur in munisipaliteite. Die studie het geïdentifiseer dat die twee elemente rakende die raamwerk vir voorsieningskettingbestuur, vraagbestuur en verkrygingsbestuur direk onversoenbaar is met die komplekse organisasieverskynsel. Die studie beveel aan dat SCM moet slaag, SCM 'n mate van buigsaamheid moet aanneem om op die interne en eksterne uitdagings te reageer.

Daarbenewens het die studie onthul dat die gereelde wysigings aan die SCM-beleidsriglyne en wetgewende raamwerk 'n aanduiding is van die kompleksiteit van SCM as 'n ondersteunende en deursnitfunksie binne die organisasie en die plaaslike regering in die algemeen. Die literatuuroorsig wat uitgevoer is, het aangedui dat SCM, vanuit 'n literatuurperspektief, verskillend is van die openbare sektor en plaaslike regering. SCM in die openbare sektor wil die totale voorwaardes van die nasionale regeringsdoelstellings nakom, terwyl die SCM-literatuur gaan oor die versekering van effektiwiteit en doeltreffendheid binne die voorsieningsketting en sy prosesse.

Die voorsieningsketting is sedert 2005 deel van die plaaslike regering met die bekendstelling van die wetgewende raamwerk op SCM. In hierdie verband het die studie aan die lig gebring dat SCM, na 13 jaar in die plaaslike regering, steeds in 'n ontwikkelingsfase was en konstante aanpassing aan die stigtingswetgewing vereis het om te verseker dat dit alle onverwagte uitdagings die hoof bied.

Daar word dus van die plaaslike regering verwag om 'n oorlewings-, evolusionêre en ontwikkelingsbenadering aan te wend om te verseker dat dit relevant bly. Dit moet

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voortdurend al sy uitdagings aanspreek, insluitend die kompleksiteit daarvan as organisasie.

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CHAPTER 1: RESEARCH ORIENTATION

1.1 INTRODUCTION

The introduction of several legislations, regulations and policies since the inception of democracy in 1994, as well as public demand for a better life and hastened quality service delivery for all citizens of South Africa has placed public sector procurement in the limelight. South African public sector organisations utilise the supply chain management (SCM) approach to address all their product and services acquisition.

SCM is therefore a vital function that guides the drafting and implementation of policy aimed at ensuring that public sector procurement is fair, equitable, transparent, competitive and cost-effective, as determined by the Constitution of the Republic of South Africa (Republic of South Africa [RSA], 1996). Public sector organisations, in the midst other challenges, are faced with the challenge of adopting and adapting to new ways of doing things. Currently, SCM is a developing approach and model in the public sector.

The literature on organisation theory and the evolution of organisations indicate a new dimension of organisations and the necessity of new approaches to how organisations function within their internal and external environments. SCM implementation in local government is confronting serious challenges, and close observation is needed as SCM failure in local government can have catastrophic implications for municipalities in South Africa. This study analyses SCM within public sector organisations, taking into account their complexity.

1.2 BACKGROUND

The research focuses on JB Marks Local Municipality, located in the North West Province. As with all other public sector organisations, the municipality is a defined by statute. The municipality has a clear boundary and consists of ten departments with a total of 1 238 employees (JBMLM Annual Report, 2018:293). SCM functions and units are placed within the finance department as a support function for the entire municipal operation. The JB Marks municipality, like all other municipalities, subscribes to the overarching municipal financial

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management scheme emanating from the Constitution and various legislation, including policy directives.

This research explores SCM within municipalities. SCM, which is not an exclusively public sector approach but also exists within private sector organisations, remains an approach that is not thoughtfully implemented within the public sector due to various factors. These include that the operations of public sector organisations, when compared to private sector organisations, who face similar challenges, are directly influenced by various factors such as politics, statutes, policy guidelines and the total environment, which results in these organisations being complex. This complexity impacts on the outcomes of the implementation of SCM within public sector organisations.

Globally, organisations have positioned themselves and their management of the procurement process in such a way that a necessity exists for them to have total control of their sourcing and outsourcing of goods. With the introduction of SCM, they have been able to deliver value. Activities that add value must receive the most focus from the organisation. Public sector organisations must adopt this from private sector organisations: they should exhaust all available opportunities for possible adoption implementation, and value-adding activities should receive the most attention.

The introduction of new public management is relevant considering the increase in public services demanded against those offered within the public sector, in particular in local government. Public sector organisations with budgetary limits are required to adopt new ways of managing public service procurement. Thus, increased intervention is required to ensure that there is maximisation of benefits from all available resources. The introduction of various service delivery methods calls for strict control and cooperation amongst stakeholders to ensure that value is created and that the demanded services are offered.

The introduction of new public management (NPM) as a paradigm shift can clearly be linked with the introduction of new concepts such as SCM in the public sector. The overall aim is efficiency of the sector. NPM advocates for the introduction of efficient private sector models and other new approaches in the public sector.

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Mentzer, de Witt, Keebler, Min, Nix, Smith and Zacharia (2001:3) suggest that the supply chain is a set of firms that passes material forward. Lambert, Stock and Ellram (1998:2) consider the supply chain as the alignment of firms that brings products or services to the market. Christopher (1992:4) defines the supply chain as organisations operating with upstream and downstream linkages and with the intention of delivering both products and services to the end consumer.

Core to the existence of SCM is that organisations consider the model with the aim of improving organisational operations, including the perceived output of creating value. It still needs to be proven within public sector organisations whether such results can be achieved or whether this is merely a myth about the model.

Wei and Xiang (2013:279) argue that successful companies consider the supply chain as a major issue and regard SCM as the control of the entire chain of systems for planning, operations, control and coordination of various activities and processes. The main aim is to ensure that the right product required by the client arrives. Therefore, in essence, the process is about managing the chain to ensure the right product, quality, quantity, status, place and time. The existence of the chain and its management is all about ensuring that value is added through the SCM process.

Benbya and McKelvey (2016:16) reiterate that complexity theory is a comparatively new way of thinking about how systems function and agents interact in organisations or firms. The theory rests on the idea that order appears through the interaction of organisms or agents (parts of a system). Benbya and McKelvey (2016:17) posit that complexity theory recognises that constant changes are present within a system that represent system stability, chaos and a melting zone.

Anderson (1999:234) views organisations as interpretive systems that first create and actualise themselves through structuration because organisations are loosely coupled systems with many possibilities, and their members must make sense of these systems either by reducing their complexity or by absorbing the system. In the view of Styhre (2002:343), organisations are open systems that are dependent on their environment. The internal environment is therefore influenced by factors from the external environment. Organisations are complex,

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dynamic and nonlinear, and they do not evolve in a predictable manner. Complexity theory and its application to organisations brings about massive opportunities to consider various epistemological ramifications.

Remanujam and Morel (1999:279) assert that complexity theory has become a cross-cutting interdisciplinary research perspective that can be traced back to mathematics, economics, linguistics and biology. The complexity approach, regardless of its disciplinary affiliations, shares common fascinating new insights with these disciplines into the dynamics of systems. The interdisciplinary approach is problematic to define as it may provide multiplicity in meaning due to its residence in various disciplines.

Organisations that function on the verge of uncertainty are inclined to display creativity and yield new and innovative behaviours within the whole system (Price, 2004:44; Styhre, 2002:347). Some proponents of complexity theory employ the concept of entropy, considered as disorder. This is about the tendency of the system to locate itself in the random state in which there is no further potential for energy transformation or work (Farazmand, 2003:341; Mckenzie & James, 2004:33; Byeon, 2005:224). Entropy is the disorder, disorganisation, lack of patterning or randomness of the organisation of a system (Byeon, 2005:224). According to Bailey (1990:71), entropy has replaced the age of equilibrium. The concept of equilibrium, as espoused in systems theory, is not sufficient to fully describe the complexity of social phenomena. Complexity theory has the ability to clench the dynamic processes of the common entropy phenomena in organisations and society at large (McElroy, 2000:198; Rhee, 2000:488; Byeon, 2005:225).

1.3 RESEARCH PROBLEM

The research focuses on the complexity affecting the functioning of SCM in local government. The research problem to be addressed is whether SCM as theoretically conceived and delimited by legislation and other policies can work in complex organisations.

It is important for organisations to understand their functioning in order to use the appropriate mechanisms when responding to challenges. In this age of innovation and creativity,

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understanding that an organisation operates within a complex system is important. The characterisation of organisations enable top management to think strategically and make recommendations about what types of model to adopt.

1.4 RESEARCH QUESTIONS

The study aims to answer the following questions:

- Can SCM work in complex organisations?
- How does complexity in organisations affect the functioning of SCM?

1.5 RESEARCH OBJECTIVES

This study aims to explore the viability of SCM in complex organisations by investigating the theoretical framework of SCM and its related legislative framework within public sector organisations, in particular municipalities. The research also aims to determine the efficiency and effectiveness of SCM within public sector organisations and to investigate the complexity of a municipality and the impact of this on the implementation of SCM.

The study has the following objectives:

- To define SCM and complex organisations.
- To determine the theoretical and legislative framework pertaining to SCM within South Africa, in particular as it applies to local government.
- To investigate SCM practices through a case study.
- To determine the effect of the complexity of organisations on the functioning of SCM.
- To make recommendations about SCM in the case study organisation, as well as more generally for similar organisations.

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1.6 RESEARCH METHODOLOGY

The research was conducted through empirical research by means of a self-administered questionnaire.

1.6.1 Research Approach

The study followed a qualitative approach through the use of a self-administered questionnaire wherein the respondents chose the most suitable options from those posed to them. According to Kumar (2014:132), the primary focus of such an approach is to understand, explain, explore, discover and provide clarity about situations, feelings, perceptions, attitudes, values, beliefs and expectations.

1.6.2 Research Design

The study makes use of a case study approach, which Kumar (2014:155) describes as a study of an individual, group, community, instance, episode, event or subgroup of a population, town or city. For research to be regarded as a case study, it is important to treat the total study population as one entity (Kumar, 2014:155).

According to Gilbert (2008:36), the advantage of a case study is that the research is conducted within specific perimeters. The disadvantage is that it is difficult and sometimes impossible to generalise the findings and focus of attention as each case has its own idiosyncratic complexity (Gilbert, 2008:36).

In this study, the case is JB Marks Local Municipality, a newly established municipality after the amalgamation of two municipalities: Ventersdorp Local Municipality and Tlokwe Local Municipality.

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1.6.3 Research Instrument

The research instrument used to gather data is a self-administered questionnaire. Kumar (2014:178) states that a questionnaire is a written list of questions presented to the respondents to record their answers.

1.6.4 Population and Sampling

The population of a study refers to all the potential participants who can provide information or evidence regarding the issue under investigation (Kumar, 2014:231). The total number of employees in the municipality is 1 238, and there are 67 councillors (JBMLM Annual Report, 2018:293).

The study makes use of purposive sampling. Purposive sampling, also called judgmental sampling, is composed of elements that contain the characteristics of the population that best serve the purpose of the study (Grinnel & Unrau, 2008:153). Sampling refers to the process of selecting cases from the population to observe (Terre Blanche, Durrheim & Painter, 2012:133). The primary concern in sampling is representativeness (Terre Blanche, et al., 2012:49). The aim is therefore to select a sample that will be representative of the population from which the researcher wishes to draw conclusions (Terre Blanche, et al., 2012:49).

The sample for the study consists of eighteen middle to senior managers, nineteen supervisors, five SCM employees, twenty-nine community members, nine councillors and one representative from the office of the Auditor-General, thus compiling a total of 81 participants. These 81 participants include ten SCM employees, ten senior managers, ten middle managers, twenty operational employees, seven municipal councillors, a representative from the Office of the Auditor-General and ten community members.

1.7 CONTRIBUTION OF THE STUDY

Considering the significance of SCM within local government, the study intends to make recommendations on whether or not SCM is the correct implementation approach for the procurement of goods and services within complex organisations. The study also aims to

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contribute to the practice of public administration by identifying good practices pertaining to SCM and aims to contribute to the academic discipline of public administration through the research findings.

1.8 ETHICAL ISSUES

Ethics are a critical part of any research and must therefore be considered prior to undertaking the study. In this research, participation was voluntarily and, in respect of employees of the municipality, the municipal manager's permission was requested for the research to be conducted at the municipality and for the researcher to interact with the respondents. Members of the community were given an opportunity to consent to participate, a record of which will be kept for future reference. Kumar (2014:285) adds that in every discipline it is considered unethical to collect information without the knowledge, expressed willingness and informed consent of participants.

1.9 CHAPTER LAYOUT

Chapter 1 provides an overview of the study through the background, research objectives and problems, and approach of the study.

Chapter 2 provides a detailed literature review of SCM, complexity theory and the importance of SCM in organisations.

Chapter 3 addresses the legislative framework relating to SCM in South Africa.

Chapter 4 provides a case study of JB Marks Local Municipality and its systematic setup.

Chapter 5 provides the results of the empirical study through the questionnaire.

Chapter 6 is the concluding chapter that summarises the study and its findings and provides guidelines and recommendations emanating from the research.

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CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

Local government faces serious challenges with regard to the implementation of SCM. Since the reorganisation of local government SCM in 2005, many municipalities have struggled to ensure continued compliance with SCM regulations. A number of factors have been identified as contributing to this challenge. The complex environment within which local government operates has as not yet been indicated as a contributing factor.

In this chapter, the concepts of 'complexity', 'complex organisation', 'complex system', 'complexity theory' and 'SCM' are discussed. In order to understand the viability of SCM in local government, the effects of complexity within the organisation must be understood, in particular how this applies to local government. The assumption is that complexity in local government affects the functioning of SCM, and therefore a way must be found to respond to the question of how SCM can work in a complex organisation.

Complexity remains a core concept and the basis on which SCM was considered in the study. Private and public sector organisations are faced with the challenges of complexity within their external and internal environments, and in some sense this complexity is considered as relating to VUCA (volatility, uncertainty, complexity and ambiguity). Bennett and Lemone (2014:1) assert that conditions brought about by the VUCA world render useless any efforts to understand the future and to plan responses accordingly. This study considers it important to determine how the external environment affects the operations of local government.

According to Keskinen (2003:7), the development of complexity science is not a single technological innovation, but a shift in a scientific approach with the potential to profoundly affect business, organisations and government. In an organisational context, complexity provides an explanatory framework of how organisations behave (Keskinen, 2003:8).

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2.2 COMPLEXITY THEORY

In order to understand complexity, one must have a clear comprehension of what a system represents. According to Allen and Moses (2001:2), a system is a set of intermingling mechanisms having well-defined behaviours or aims. At the same time, what appears as a system to one person differs substantially from another person's understanding. Therefore, a 'complex system' refers to a system with mechanisms and interconnections, interactions or interdependencies that are difficult to define, comprehend, forecast, manage, design or change.

In the functioning of a system there are interrelated systems issues that are of critical importance to comprehend within the environment of the system. As described by Allen and Moses (2001:2), those aspects often end with 'ility', such as flexibility, agility, maintainability, adaptability, scalability, modularity, durability and reliability, to mention a few. Flexibility, for instance, relates to the possession of a system that is adept at experiencing changes which relate easily and which can occur in many ways, while agility relates to the ability of a system to be flexible and undergo rapid change.

Three issues appear to be central to the functioning of a system, namely interdependence, interconnectedness and interaction. According to Allen and Moses (2001:3), interdependence refers to the association amongst articles that cannot exist without each other; interaction refers to the properties of entities that exchange something material or immaterial that constitute or contribute to their interdependence, and interconnectedness defines the association amongst entities that are abstractly connected and the connection paves the way for interaction. Figure 2.1 below depicts complexity within a system or organisation.

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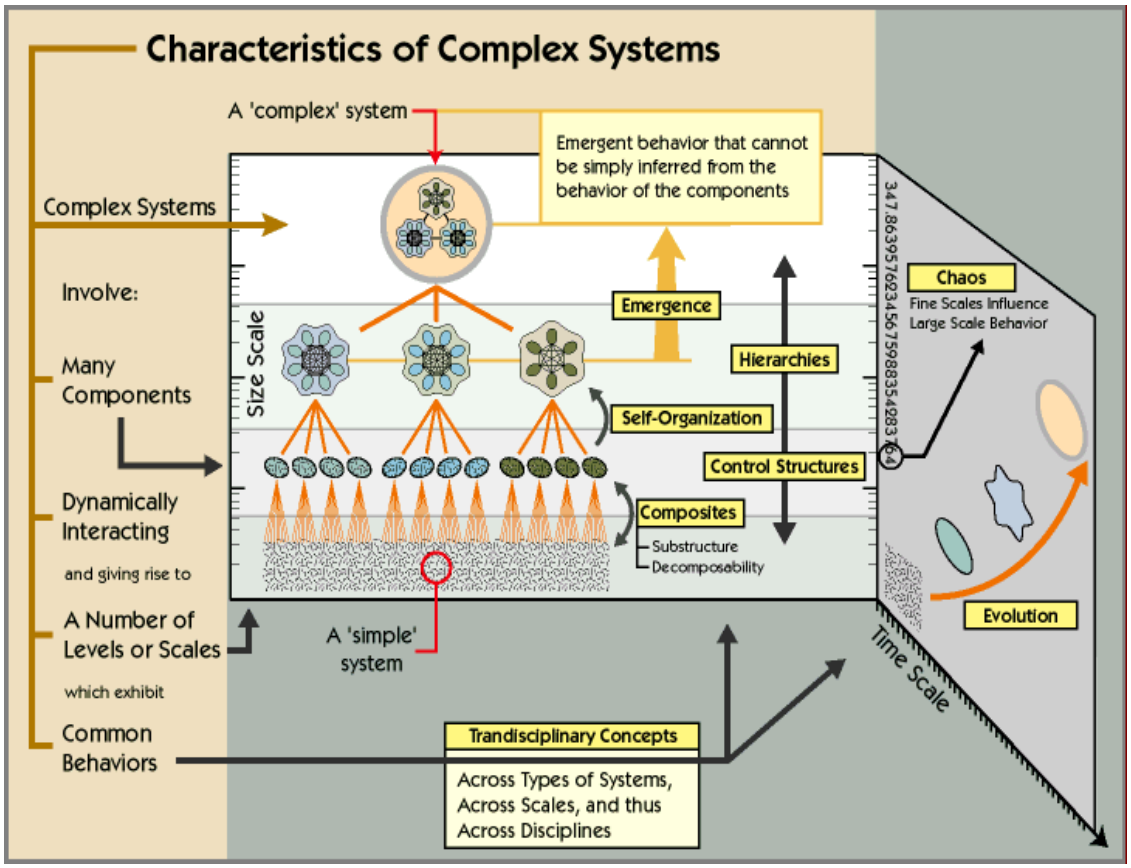

Figure 2.1: Characteristics of a complex system

Source: Adapted from the New England Complex Systems Institute 2006.

The figure above represents the characteristics of a complex system. A complex system consists of many components interacting and giving rise to a number of levels that exhibit common behaviour. As with organisations, a control structure exists in a hierarchical order. Due to the effects of complexity, chaos occurs and influences the behaviour of the system and is then countered by reorganisation of the system. Individual components of the system act autonomously, guided by basic internalised rules with team or group members' interactions being regarded as nonlinear. Each member's actions in the team have an influence on the team and the system as a whole, and the individual contributions can produce unpredictable behaviour. A complex system is an open system that interacts with its environment. These interactions and their implications reflect the actual activities of an organisation, including the complexity of organisations.

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Therefore, a system is complex when it consists of many parts that are interconnected in an intricate way. Complexity literally means interaction of a quantity of features in many varied ways within a system or organisation. The South African system of government with its different spheres is interrelated, interdependent and distinctive.

2.2.1 Complexity Theory and Organisations

Waterman, Peters & Phillips (1980:14) in their famous article 'Structure is Not Organisation' state that a structure does not necessarily depict an organisation, although it is important to undertake that organisations are made up of various components, including structure. Laegaard and Bindslev (2006:9) argue that organisations tend to become too extensive as they involve various factors, such as society and influence on and from other organisations. Naturally, there are also intra-relationships amongst teams within organisations and this allows an organisation to be viewed from different angles. Organisations as open systems are reliant on their immediate environment, and hence organisational evolution is determined to some extent by the outside world. Cleveland (1994:1) maintains that complexity theory helps to understand and identify how organisations manage changes in order to return to an orderly state.

Organisations have been researched for centuries to establish how they are structured and how they function, including the contribution by those responsible for managing them. Various writers have arrived at a variety of conclusions to the extent that some findings declare that organisations are to some degree chaotic and complex. The descriptions are informed by the fact that the conditions within which organisations find themselves operating are constantly changing and their internal functions are being constantly adapted to create space for external factors and internal rearrangements that affect them.

A point of departure for the study was to determine the definition of complexity, its properties, whether complex organisations exist and to what extent municipalities are complex. Mason (2008a:2) strongly believes that complexity theory is a relative stranger to the social sciences. It is, according to Morrison (2002:6), a theory of survival, evolution, development and adaptation, and it focuses on the environment, the organisation and its complex systems composed of a large number of constituent elements or agents that are linked and interact in different ways.

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Mason (2008:1a) indicates that the current trend within organisations is complexity, which seeks to provide an understanding of order and stability and how they emerge from the interactions of many constituent parts according to a simple rule. According to Mason (2008:2a), complexity theory offers useful insight into the nature of continuity and change. Mason (2008:4a) states that thinking according to the perspective of complexity theory challenges the modes of interpretation and in the process offers useful insight into projects such as in education and research. Axelrod and Cohen (1999:373) reflect on the number of contemporary trends that contribute to the growth of interest in complex systems as influenced by the changes that take place in the structure and operational scope of organisations.

Morrison (2008:6) introduces complexity theory using the Newtonian approach that asserts the universe is rationalistic, deterministic and of a clockwork order. Thus effects are functions of causes, while predictability, causality, patterning, control, universality, linearity, continuity, stability and objectivity all contribute to the view of the universe as an ordered mechanism in an albeit complicated equilibrium, a rational, closed, controllable and deterministic system. Newton's view is, however, challenged by complexity theory as it introduces and suggests alternative ways of perceiving the world (Morrison, 2008:6a).

Morrison (2008:6a) claims that change is ubiquitous and that stability and certainty are rare. Thus, complexity theory is a theory of change, evolution, adaptation and development for survival. It supplants simple secessionist cause-and-effect models, linear predictability and a reductionist approach to understanding phenomena, replacing them with organic, nonlinear and holistic approaches, respectively (Santonus, 1998:3).

Stable systems fail and change, and disequilibrium and unpredictability are requirements for survival (Stacey, 1992:40). According to Snyder and Jervis (1993:9), objectively complex systems are considered according to their multitude of components and the feedback among those components. In this respect, complexity tends to be identified by its relationships rather than by its constituent parts.

Complexity has therefore become the catchword of the day, especially if and when problems arise in any situation and organisation. Lissack (1999:112) argues that on a daily basis the media informs people that they live in an environment wherein complexity is central and organisations are facing massive rising levels of disorderliness. Lissack (1999:112) posits that

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in order to improve the level of disorder, managers can improve decision making and search for innovative solutions by utilising complexity theory as a promising framework that accounts for the dynamic evolution of industries and/or organisations.

On the same note, Lissack (1999:112) argues that complexity theory is less an organised, rigorous theory and more a collection of ideas that share the notion that within dynamic patterns there may be underlying simplicity. This simplicity, according to Lissack (1999:112), includes ideas such as phase changes, fitness landscape, self-organisation, emergence, attractors, symmetry and symmetry breaking, chaos, quanta, the edges of chaos, self-organised criticality, generative relationships and increasing returns to scale.

According to Reason and Goodwin (1999:313), complexity theory suggests that we live in an unpredictable but nevertheless intelligible world. Lewin (1999:215) posits that one of the most fundamental implications emerging from the science of complexity is that order naturally emerges in a system; no matter how simple, complex, nonlinear or chaotic the system is, natural order emerges through self-reorganisation. In this regard, Mathews, White and Long (1999b:440) maintain that the central notion is about change, evolution, and adaptive and emergent behaviours, with the understanding that the traditional and reductionist approaches, as employed in much management and organisational literature, are particularly ill-suited to explaining these types of behaviour in organisations.

Ferreira (2001:6) provides a rigorous definition of complexity as the element of a system that is noticeable in the inability of any formalism being adequate to capture all its properties. Groban (2005:361) suggests that complexity implies diversity or a great number of connections among a wide variety of elements. Groban (2005:359) continues to state that organisations are now routinely viewed as dynamic systems of adaptations and evolutions that contain multiple parts that interact with one another and the environment. This argument represents the current situation of private or public sector organisations. For the purpose of this research, the writer posits these organisations were on the edge of chaos while evolving and adapting, resulting in their being complex.

According to Mason (2007:10), complexity can therefore be regarded as a measure of heterogeneity of diversity in internal environment. This includes factors such as departments, customers, suppliers, socio-politics and technology. McElroy (2000:198) takes this further,

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stating that the main focus of complexity theory is how elements at micro level affect emergent behaviour and overall outcome at macro level. This definition indicates that complexity theory is based on a system functioning approach with various components or levels of operations. From a global view, organisations are determined to function as systems interconnected through various subsystems or departments that are structured into various sub-departments and components operating independently but in an interconnected manner as systems.

Lissack (1999:120) advances that for the past 50 years, organisational sciences have focussed on controlling uncertainty and that for the past ten years complexity science has focused on understanding it as better to 'go with the flow' and perhaps to channel that flow. Therefore, organisations have a choice of how to approach uncertainty within organisations. According to Lissack (1999:122), understanding the complexity approach to organisations gives organisations access to new tools, vocabulary and possibilities for action.

Luhmann (1995:25) states that an interconnected collection of elements can be called complex due to its imminent constraints in elements. White (2000:167) asserts that systems are considered to be evolving and self-organising into something new. On the other hand, Sherif (2006:73) claims that the emergence of order may be considered very disorderly, which explains why the complexity of information to plan and predict is so intricate.

In order to address challenges, an organisation may consider the complexity theory approach, which offers a new way of conceptualising many of the apparent paradoxes confronting organisations (Mathews, White & Long, 1999:220a). Complex organisations incorporate various characteristics, behavioural patterns and types of complexity. The next section addresses these, thereby providing a comprehensive picture of what could be considered 'complex', as well as types of complexity.

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2.2.1.1 Characteristics and behavioural patterns of complex organisations

In the view of Anderson (1999:234), an organisation represents informative organisms. Dolley (2002:2) states that organisational complexity is defined as the amount of differentiation that exists within the different elements constituting the organisation. According to Rhee (2000:488), the structural characteristics and behavioural patterns in a complex system are due to interactions between the system's parts. Complex systems tend to be deterministic in nature and to evolve through a phase of instability, which eventually reaches another threshold where a new relationship is established between the system's internal and external environment and itself (Sullivan, 2004:46; McElroy, 2000:197).

Organisational complexity can also be observed via differentiation in structure, authority, locus of control and attributes of personnel, products and technologies. The organisation behaves in a particular manner in an attempt to fit with its environment. Organisations are more or less complex as a reaction to environmental complexity. The environment may be complex because it is turbulent, hostile, diverse, technologically complex and restrictive, and the technological aspect may be core to this complexity.

Organisations that operate near a threshold of instability tend to exhibit creativity and to produce new and innovative behaviours at the level of the whole system, as determined by Styhre (2002:347) and Price (2004:44). In attempting to provide a clear picture and a self-explanatory approach used by complexity theory, one can look at some proponents of the theory that employ the concept of entropy. A simple definition of entropy is disorder, and this can be explained by what is seen as the tendency of a system to move towards a more random state in which there is no further potential for energy transformation or work (Farazmand, 2003:341; Mckenzie & James, 2004:33; Byeon, 2005:224). Entropy is the disorder, disorganisation, lack of patterning or randomness of the organisation of a system (Byeon, 2005:224). According to Bailey (1990:71), entropy has replaced the age of equilibrium.

Schneider and Sommer (2006:354) assert that organisational complexity refers to a number of activities of subsystems within an organisation with the dimension of vertical or number of levels, horizontal or number of units, departments, spatial and number of geographic locations and propose that there are three interrelated building blocks of complexity theory; non-linear dynamics, chaos theory and adaptation/evolution. Relationships among the elements of a

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system are usually nonlinear, so the cause-effect relation is not clear. Dissipative structures are characterised by high states of energy exchange within the environment. The structure exhibits an inherent instability that leads it through multiple transitions, reached through a series of points, rather than a tendency towards equilibrium, while at each point (Baker, 1993:137). The structure moves to a new and generally higher level of complexity that is qualitatively and quantitatively different from previous states. Systems such as dissipative structures have an emergent quality that comes from the interaction of their elements, subsystems or agents rather than from the system's interaction with its environment (Morel & Ramanujam, 1999:279). Dissipative structures may react disproportionately to an environmental change; thus a small exogenous event may trigger a change in the fundamental character of a system.

Prigogine and Stengers (1984:156-159) provide a relevant example of the central tenet of complexity in self-organisation using acrasiales amoebas:

> *"If an environment of the slime-mould becomes depleted in the essential nutrients needed to sustain life, the amoebas discover this through chemical sensors and cease to reproduce; they collect together and form a 'foot' containing about a third of the aggregated cells and spores and migrate in search of a new environment that is suitable to sustain life, forming a new colony of amoebas."*

Morrison (2002:16) calls this real self-organisation as the organism is responding to the environment by reconfiguring itself and changing in order to survive. The process is dynamic, and the slime mould demonstrates autocatalysis, a central feature of self-organisation. This reflects the ability of the system to evolve itself from within, and in this instance, the local circumstances inform the nature of the emerging self-organisation (Marion, 1999:31).

Coevolution is about the capacity of an organisation to change simultaneously with its environment. Since the environment is also composed of other systems, those systems too change and impact each other as a result of this interaction (Walby, 2007). It should be emphasised that adaptation and coevolution are complementary (and often simultaneous)

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processes of self-organisation that indicate the resilience of complex systems, that is, their ability to adjust to change (Rihani, 2002:236).

Ordinarily, the external environment of the organisation falls outside of its direct control, e.g. factors such as competition, economical variations, politics, technology and sociocultural considerations play a critical role (Capps & Hazen, 2002:310). Indirectly, this indicates that an organisation can adapt to specific changes as influenced by external environmental factors, such as through changing its structure and adapting its internal functioning (Sherif, 2006:77).The organisation can therefore experience growth resulting from changes in the environment as informed by changes in competition, increase in availability of information, innovation factors, customer prediction challenges and service requirements (Beeson & Davis, 2000:185).

In this regard, complexity theory provides an enhanced appreciation of how the subsystems of the organisation interconnect and interact, and the nature of the interplay among the various components. Such an understanding can help organisational leaders plan how to better obtain resources such as raw materials and information; transform resources by making use of social and technological components; and produce the best results (Yoon & Kuchinke, 2005:17).

2.2.1.2 Types of complexity

Manson (2001:405) breaks down complexity into three types for the purpose of ensuring a better comprehension of the concept: algorithmic complexity, deterministic complexity and aggregate complexity. These types will be outlined in detail according to Manson's (2001:455-411) typology.

Manson (2001:455) indicates that deterministic complexity lies in chaos and catastrophe theories. These theories are different, but they are similar in use and import. The theory holds that there exists a true chaos in keeping with popular usage and a robust chaos that is seemingly random but in fact is the manifestation of some accessible underlying order. Deterministic complexity has four key characteristics: (1) the use of deterministic mathematics and mathematical attractors; (2) the notion of feedback; (3) sensitivity to initial conditions and bifurcation; and (4) the idea of deterministic chaos and strange attractors.

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Manson (2001:409) states that complexity research increasingly considers systems of linked components or aggregate complexity. Algorithmic complexity and deterministic complexity rely on simple mathematical equations and a number of assumptions about how complex systems work and attempt to access the holism and synergy resulting from the interactions of systems. The key attributes of aggregate complexity include relationships among entities, internal structure, surrounding environment, learning and memory, emergent behaviour, and the different means by which complex systems change and grow (Manson, 2001:409). These attributes are detailed below:

- Relationships: The heart of aggregate complexity lies in the relationships among the components. A complex system is defined more by relationships than by its constituent parts. All subsystems and individual components typically have functions or goals but, given the complexity of the relationships among components, it is impossible to characterise the systems on the whole as having a unified purpose.
- Internal structure: The components of a system and their relationships are not an undifferentiated mass. The relationships of differing strength among the component parts define the internal structure of a system.

- Environment: A complex system owes its existence to the relationships with its environment, defined as anything outside of the system. Regardless of the actual boundary between a system and the environment, the former passes on information about the system's components and eventually creates outflow from the system into the environment.
- Learning and memory: A complex system is not beholden to the environment that it actively shapes, anticipates and to which it reacts. The system remembers through persistence and subsystems with the capacity to accommodate the influx of energy (Manson, 2001:410). A complex system can deal with truly novel situations because it has a wide array of internal components and subsystems linked by complex relationships. Some of these components may have ability to accommodate a novel relationship; however, in rare cases when no suitable component or subsystem exists, the system cannot respond to new relationships with the environment, and this can have catastrophic results.

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- Emergence: The capacities of a complex system are greater than the sum of its constituent parts as a system can have emergent qualities that are not analytically traceable from the attributes of its internal components. The emergent phenomenon may not be predictable nor controllable. Mason (2008b:2) claims that complexity theory's notion of emergence implies that, given a significant degree of complexity in a particular environment or critical mass, new properties and behaviours emerge that are not contained in the essence of the constituent elements or able to be predicted from a knowledge of initial conditions.
- Change and evolution: A complex system constantly changes, largely through three different types of transition: firstly, a key characteristic of a complex system is self-organisation, the property that allows it to change its internal structure in order to better interact with its environment. The self-organisations aspect allows a system to learn through piecemeal changes in its internal structure. Secondly, a system becomes dissipative when outside forces or internal perturbations drive it to a highly unorganised state before suddenly crossing into one with more organisation. Thirdly, instead of occasionally weathering a crisis, a system can reach a critical point where its internal structure lies on the brink of collapsing without actually doing so.

Waldrop (1992:294-299) posits that one must scan and sense the external environment and then make internal adjustments and developments in order to meet the demands of the changing external environment. The above is confirmed by the law of requisite variety that determines that internal systems, flexibility, change and capability must be as powerful as those in the external environment. Closed systems, according to Prigogine and Stengers (1984, as cited in Marrison, 2002:19) remind, run down and decay into entropy unless they import energy from the outside environment, aligning with a 'change or die' philosophy.

2.2.2 Complexity Theory in Evaluating and Analysing Organisations

It is clear that the traditional approach that was used to explain and interpret organisations and their process is not adequate for providing a clear and concise description of organisations such

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as municipalities. In this regard, Mathews, et al. (1999b:440) indicate that a complexity theory approach appears well suited to enhance efforts to address several controversies and paradoxes. The write is observing that A growing number of researchers are beginning to incorporate arguments from the complexity approach in analysing organisational phenomena and suggest an immediate and all-encompassing incorporation of the complexity approach into organisational analysis in order to overcome many of the problems besetting organisations. These researchers believe this approach offers a fundamentally new way of conceptualising many of the apparent paradoxes confronting organisations.

2.3 SUPPLY CHAIN MANAGEMENT

The supply chain as a concept and organisational model has become an old subject within the context within which organisations operate. Organisations seek to achieve the best possible results on a daily basis in terms of quality and quantity results at the lowest possible cost, and are constantly considering various methods to achieve this objective. One approach that organisations have considered is the use of the supply chain.

Den Butter and Linse (2008:76) state that recent research has shown that with the increasing trend of globalisation, more and more companies have realised that following the right procurement strategy is important. Wacker (2016:20) agrees with Kraljick's (1983) demand that purchasing must become supply management. Thus, purchasing today is no longer a simple function of buying and selling but has become an integrated management function that offers new opportunities.

Core to this study is SCM's evolution and adaptation into the public sector environment from its origin of being a private sector approach. Kleab (2017:3970 determines that today, more than ever before, supply chain management has become an integral part of business and is essential to any company's success and customer satisfaction. This indicates that SCM has become an important cross-function amongst all other functions involved in the organisation.

SCM exercises a significant influence on the gross domestic product. Stevenson and Spring (2007:686) state that due to the growth in organisations subcontracting their internal functions, organisations have become dependent on partners to ensure that they are able to create value

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and deliver this value to their customers. Therefore, organisations have become fully aware of the need to collaborate and have control of their supply chain. This awareness and focus of the firm has resulted in a blurring of the traditional boundaries of the firm.

Stevenson and Spring (2007:701) assert that uncertainty regarding SCM ordinarily has many dimensions such as challenges relating to the reliability of suppliers, the conduct of competitors and maintenance of product quality. Stevenson and Spring (2007:701) identify the key elements of uncertainty as quantity, timing and end user demand, and these result in the bullwhip effect within SCM. A critical assumption is made by Stevenson and Spring (2007:702) that a need exists within organisations for flexibility in order to respond to and cope with the effect and impact of uncertainty.

The need for organisations to adopt the SCM approach is unavoidable and therefore should receive adequate attention within the organisation. The dominance of the supply chain within private sector organisations necessitates public sector organisations follow suit in having full control of their supply chain process.

2.3.1 Supply Chain Management Defined

Habib (2011:4) posits that some authors define SCM in operational terms, which is about the need for the flow of goods and services as an integrated management process and system. Christopher (1992:1) considers SCM as the management process that involves a network of organisations with upstream and downstream linkages, with the overall aim of creating value as a result of the products and services delivered to the end user. As Christopher's (1998) definition suggests, organisations involved in a chain operate as a web or network. While these are numerous and diverse, two themes appear to be important: a network/web involves more than one organisation with direct and indirect activities, and a network has linking forms of relations and governance approaches, such as partnership supply.

Stevenson (1994, as cited in Habib, 2011:4) posits SCM is a management process that involves a web of organisations involved in upstream and downstream processes within the relationship, with the aim of creating value as a result of the products or services delivered, which is depicted as follows in Figure 2.2.

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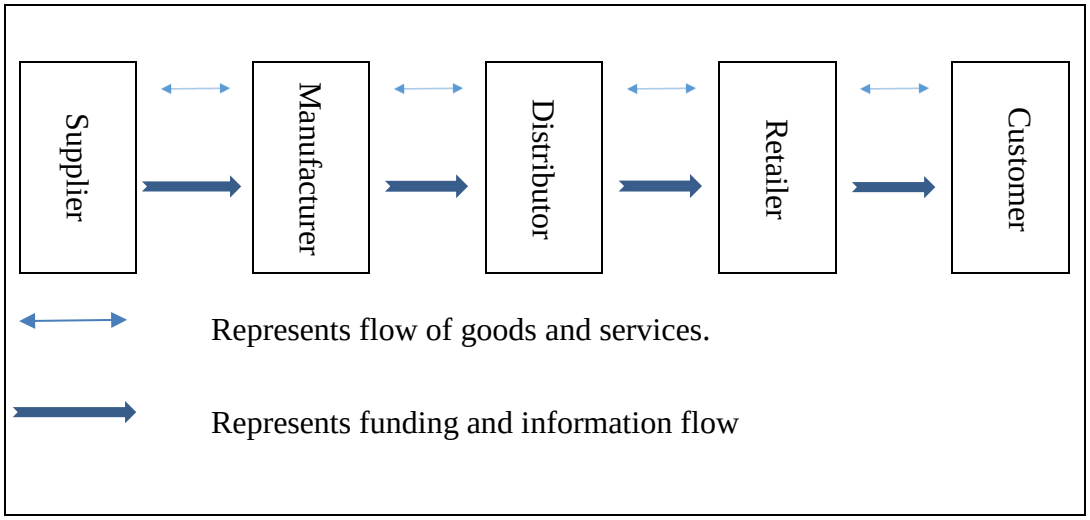

Figure 2.2: A basic supply chain

Source: Adapted from Chopra and Meindil (2001).

The above figure indicates that the flow of goods and services is the core underpinning the supply chain, and therefore the overall objectives are competitiveness and customer prioritisation with information sharing and flow being core to the relationship.

Habib (2014:4) considers SCM as a management process that extends from raw material acquisition to final product, linking all supplier and users industries. Therefore, Ballou (2007:333) states that SCM is the result of logistics. Prior to the 1950s, logistics was thought of in military terms and involved the procurement, upkeep and conveyance of military amenities and material, including military personnel. Figure 2.3 below shows the activities in an organisation involved in SCM value-creation processes.

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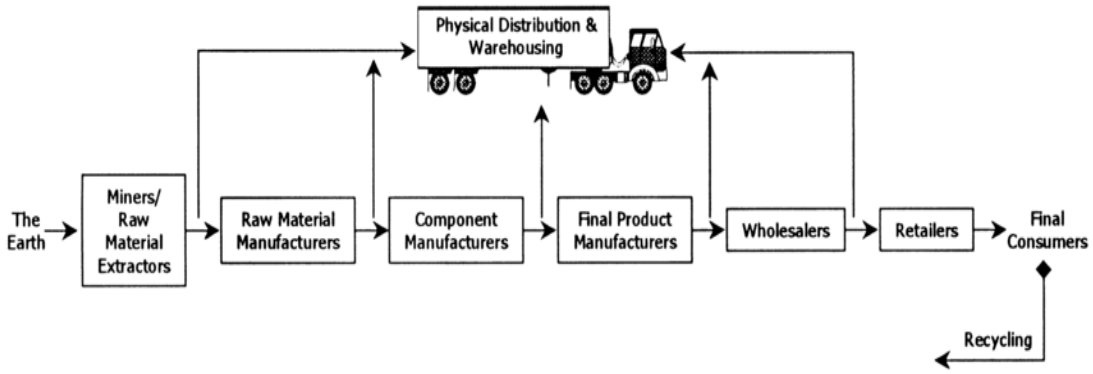

Figure 2.3: The firm and its activities in the supply chain management value creation process

Source: New and Payne (1995).

Ballou (2007:333) suggests that SCM must be organised through its key activities. This is in line with functional areas such as those found within the organisation as functions and responsibilities of management. The grouping together of functions within an organisation is due to cost considerations. Logistics costs have become very high while production and marketing as key activities and management functions should be important areas for attention (Ballou, 2007:335).

The first logistics activity has always been physical distribution in line with outbound orientation as this represents about two-thirds of the cost. It is useful to look at what was envisioned by early proponents of the areas to see the fit with current views and to give some idea of future directions (Ballou, 2007:335).

When one compares the early vision of logistics and physical distribution with SCM, a minor difference appears. According to the definition offered by Smykay, Bowersox, and Mossman (1961:1), "Physical distribution can be broadly defined as that area of business management responsible for the movement of raw materials and finished products and the development of movement systems."

SCM therefore became the new buzzword within the logistics environment, and Ballou (2007:337) posits that the origin of the term seems a mystery compared with the terms 'physical distribution' and 'logistics'. Academic research confirms that SCM is about integration of already-existing concepts and ways of doing things. "A supply chain is the process which

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includes facilities functions and activities that are involved in producing and delivering a product from suppliers to customers" (Ali & Habib, 2012:36).

According to Stevenson (2007:694), SCM is a sequence of suppliers, warehouses, operations and retail outlets. Different organisations do not necessarily have identical supply chain processes due to the differing nature of their operations and their primary manufacturing operations or services. Each organisation will therefore have its own approach to the implementation of SCM, which is important when comparing the private sector approach with that of the public sector.

In order to understand SCM, it is important to know what the supply chain is all about. Habib (2011:5) argues that SCM is a concept whose primary objective is to integrate and manage the sourcing, flow, and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers with the objective being to synchronise the customers' requirements with materials flow to strike a balance among conflicting goals of maximum customer service, minimum inventory management, and low unit costs.

Habib (2011:5) continues to argue that SCM must be viewed as a single process that is the responsibility of the different divisions in SCM and is transferred to functional areas such as manufacturing, purchasing, distribution and sales. This argument by Habib (2011) places SCM as an important management function. Habib (2011:5) claims that 'supply' is a shared objective of practically every function in the chain. It is of particular strategic importance because of its impact on overall costs, profits and market share. SCM invites different points of view on inventories that are utilised as a balancing mechanism of last, not first, resort with the latest approach to systems that requires integration rather than interfacing, as confirmed by Houlihan (1988). SCM, according to Ali and Habib (2012:36), is a conventional management tool for all manufacturers who strive to improve their product and to shorten their product delivery and response timeously in a highly competitive market.

According to Du Toit and Vlok (2014:26), SCM is about all activities connected with the flow of products and services from raw material to finished goods. It involves collaboration among all stakeholders who influence a product during its lifecycle.

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Wisner (2001, as cited in Du Toit & Vlok, 2014:26) defines the supply chain as a series of companies involved in making end products available to customers, and as including all functions, processes and activities involved in sourcing, making and delivering the products or services to customers. Therefore, one can see that the supply chain varies from company to company. It is informed by its size, length and complexity. Some companies or organisations do not necessarily have a huge supply chain and to some extent have only a single supplier, resulting in a short chain. Other organisations have massive and complex supply chain processes, resulting in the requirement of a special setup to manage the process or a dedicated SCM unit.

Jauhar and Pant (2016:993) regard SCM as a set of approaches to managing the upstream and downstream relationship with suppliers and customers to deliver high value at the lowest possible price as a whole supply chain. Stock and Boyer (2009:706) regard SCM as the management of a network or web of relationships within an organisation and among interdependent organisations and business units consisting of material suppliers, purchasing, production facilities, logistics, marketing and related systems. SCM facilitates the forward and reverse flow of material, services, finances and information from original producer to final customer with the benefit of adding value, maximising profitability through efficiencies and achieving customer satisfaction.

Habib (2011:4) states that SCM places customers as the focal point of the supply chain since the primary purpose of any supply chain is to satisfy customer needs, in the process generating profit for itself. Lambert, Cooper and Pagh (1998:1) define SCM as the integration of key business processes from end user through original supplier that provides products, services and information that add value for customers and other stakeholders.

Peristeris, Kilbourn, & Walters (2015:2) assert that the two definitions reflect a number of aspects:

- How independent organisations manage their relationships and functions;
- How the management of logistics caters for functions falling outside the scope of logistics;
- How raw material and finished goods are linked with the flow of information and finances;

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- How profits can be maximised through value creation and customer satisfaction; and
- How the organisational processes are integrated across multiple SMC activities.

Scott and Westbrook (1991) and New and Payne (1995, as cited in Habib, 2011:5) describe SCM as the management of the chain linking the elements of product manufacturing and raw material, which incorporates other aspects of the organisation and its boundaries. Baatz (1995, as cited in Habib, 2011:5) expands SCM to include products that can be reused and are recyclable. SCM focuses on how "organisations utilize their suppliers' processes, technology, and capability to enhance competitive advantage" (Farley, 1997:13) and on the coordination of the manufacturing, logistics and materials management functions within the organisation. When all strategic organisations in the value chain are integrated and act as a single united entity, performance is improved through the system of suppliers.

2.3.2 Origin of Supply Chain Management

Ballou (1978, as cited in Habib, 2011) claims that SCM has its origin in logistics. In military terms, logistics has to do with the procurement, upkeep and conveyance of military capacity, material and workforce, this was later followed by circulation and logistics that occurred in the 1960s and 1970s.

The SCM concept was coined and emerged in the 1980s through logistics consultants, and the term and concept have become popular within organisations. A number of journals, such as those concerning manufacturing, distribution, marketing, customer management and transportation integration, have published extensively on the subject (Handfield, 1998, as cited in Habib, 2011:8). The presence of SCM in most fields is an indication that it is a multidimensional concept and fits in all areas of organisations.

Drucker (1998:4) claims that there is a general shift in organisations so that they no longer compete as autonomous entities but rather function as supply chains. This indicates the level at which the concept is entrenched within organisations. During the 1990s, many organisations, in particular manufacturers and service providers, sought to collaborate with suppliers and upgraded their purchasing and SCM functions from a clerical role to an integral part of a new

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phenomenon known as SCM (Tan, 2000:39). Figure 2.4 depicts the emergence and evolution of SCM. The figure is derived from Habib and Jungthirapanich (2008).

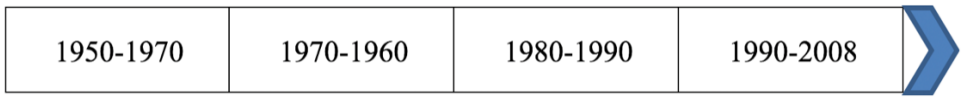

Figure 2.4: Timeline of the emergence and evolution of supply chain management

Source: Habib and Jungthirapanich (2008).

The above categories can be further defined as follows:

- 1950-1970: The period in which the logistics concept was initiated.
- 1970: The logistics concept was considered to be mature within the industry.
- 1970-1980: The period within which the SCM concept was initiated.
- 1980-1990: SCM was introduced at full steam within the manufacturing industry.
- 1995: SCM was initiated within the service industry.
- 2007: Educational SCM was introduced.

Figure 2.5 shows the evolutionary timeline of SCM.

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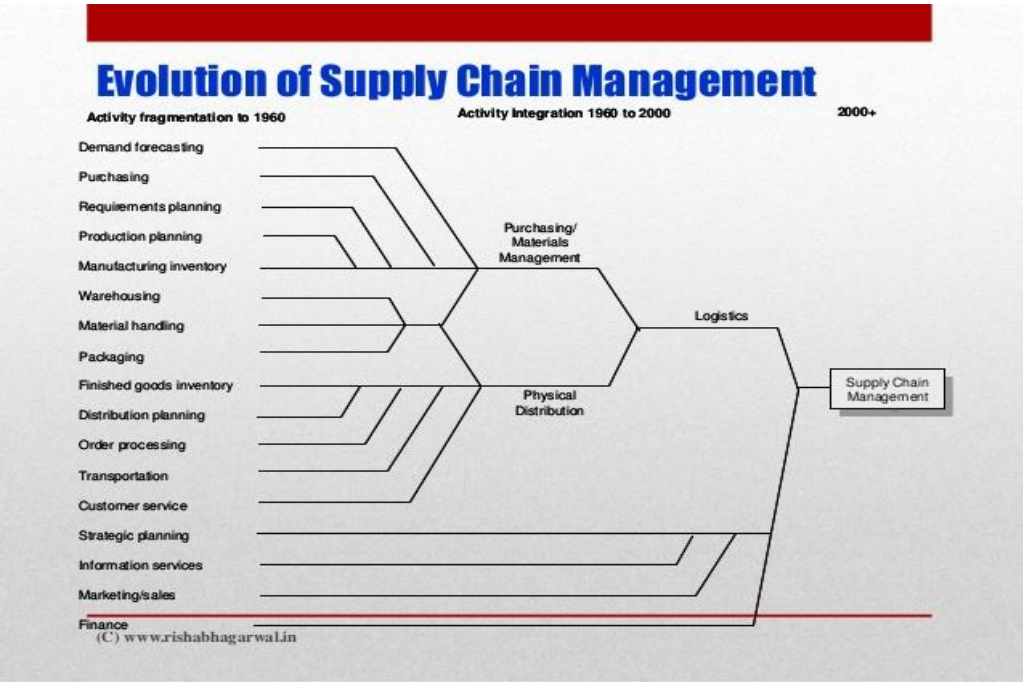

Figure 2.5: Evolution of supply chain management

Source: Habib and Jungthirapanich (2008).

2.3.3 The Purpose and Importance of Supply Chain Management

According to Ali and Habib (2012:35), the supply chain includes suppliers, distributors, retailers and customers, with customers as the main focus of the chain since the primary purpose of any supply chain is to satisfy customer needs. Tassabehji and Moorhouse (2008:55) claim that the importance of supply management and procurement within the supply chain has increased over the past 20 years. Wei and Xiang (2013:279) describe SCM as a system for planning, coordination, operation, control and optimisation of various activities and processes in an organisation. The main goal is to ensure the right products required by customers are available at the right time, in the right quantity, of the right quality, with the right status at the right place (Wei & Xiang, 2013:279).

Wei and Xiang (2013:280-281) maintain that SCM is important in an organisation because of its enhancement of the management and control functions in an organisation. The authors state that enterprises should develop and pay special attention to the management and control of the supply chain in order to identity its benefits and to ensure a long-term focus on the development

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of the supply chain (Wei & Xiang, 2013:280-281). The second aspect raised by Wei and Xiang (2013:280-281) regarding SCM's importance is that it reduces transaction costs and facilitate information sharing, enabling enterprises to maintain a high degree of market sensitivity.

Habib and Jungthirapanich (2008:1) assert that the goal of SCM is to integrate and optimise activities within and across organisations for all stakeholders' satisfaction. Typical supply chains may consist of manufacturers or service providers who receive inputs from suppliers, process these inputs and deliver them to customers.

SCM is a systematic, integrated management philosophy. Its core purpose is to enable companies to fully understand the customer and the market demand with suppliers and other partners in the business to keep pace, share and integrate resources, coordinate and support all enterprise collaboratives to market risk and effectively meet customer needs of functional systems, build quality brand resources and ultimately achieve long-term sustainable development of enterprises (Wei & Xiang, 2013:282).

Ali and Habib (2012:36) posit that SCM initially related to inventory management within the supply chain and, in the course of time, advanced SCM capabilities radically improved customer responsiveness, developed customer service and satisfaction, increased flexibility for changing market conditions, improved customer retention and brought about more effective marketing. Habib (2011:1) further claims that SCM is needed for various reasons: improving operations, improving outsourcing, increasing profits, enhancing customer satisfaction, generating quality outcomes, tackling competitive pressures, increasing globalisation and increasing the importance of e-commerce. The growing complexity of supply chains can assist the business organisation when competing in the dynamic international market and to create customer value. Habib (2011a:4) maintains that the most important benefits to businesses with advanced SCM capabilities are radically improved customer responsiveness, better developed customer service and increased customer satisfaction, increased flexibility for changing market conditions, improved customer retention and more effective marketing.

Successful SCM requires effective communication, supply chain visibility, event management capability and performance metrics, as well as coordination of activities and information sharing among supply chain partners at three decision levels: strategic, planning and operating (Ali & Habib, 2012:40). Habib and Jungthirapanich (2010a:292) claim that the performance of

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SCM depends on the seamless coordination of all supply chain stakeholders to ensure attainment of desirable outcomes.

2.3.4 Understanding the Supply Chain and Supply Chain Management through Stakeholder Theory

The interconnectedness of organisations through various networks that contribute towards the development, distribution and delivery of the organisational mandate or objectives indicates a supply chain. The chain must be managed for continued relations. All those within the chain who contribute to organisational efficiency are deemed to be stakeholders, which is underpinned by stakeholder theory.

According to Freeman and Harrison (2010:3), stakeholder theory or stakeholder thinking has emerged as a new narrative to understand and remedy three interconnected business/organisational problems:

- The problem of understanding how value is created and traded;
- The problem of connecting ethics and capitalism; and
- The problem of helping managers to think about management such that the first two problems are addressed.

The word ‘stakeholder’ originated in 1963 to challenge the notion that stockholders were the only group to whom management needed to be responsive. According to Freeman and Harrison (2010:4), scholars in the late 1980s working to develop management theories to help explain management problems involving high levels of uncertainty and change looked into this aspect. Prior to this, management theories focused on certainty, prediction and behavioural control.

The supply chain and SCM are value-creating aspects of the organisation and by their nature address role players’ supporting the organisation in order to achieve the organisation’s objectives. Stakeholder theory addresses anyone involved in the process of creating value for the organisation.

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Freeman (1985), Jones (1995) and Welsh (2005), as cited in Freeman and Harrison (2010:4), suggest that if stakeholder theory is adopted to analyse relationships among businesses, groups and individuals who can affect or are affected by the relationship, it will be more likely that the abovementioned three problems interconnected with business can be effectively addressed. In order to address these, along with other problems, and to optimally understand the organisation, the best option is to understand how its relations work and change over time.

2.3.5 Supply Chain Management in Local Government

Supply chain management in public sector procurement is a process whereby goods and services are acquired from external providers with the aim to meet the developmental needs of a government (Fourie, 2015:38). Ambe (2012:20) determines that supply chain management is strategic to the quest for service delivery excellence in South African municipalities. It is a well-known fact that 2005 was the start of the supply chain management within municipalities, this brought about a new approach to procurement in the public sector.

Supply chain management is a philosophy aimed at integrating a network or upstream linkages inside the organisation and downstream linkages in performing specific processes and activities that will ultimately create and optimise value for the customer in the form of products and services, (Hugo, Bardenhost-Weiss & van Biljoen, 2004:5). Ambe (2012:20) posits that SCM integrates demand and management within and across the organisation.

Ambe (2002:427) explains that supply chain management in the South African public sector is a fairly new concept, introduced in 2003, and SCM policies are complex and impact significantly on the smooth functioning of government and its competitive position. The major governing policy frameworks that control SCM activities in South Africa include the Public Finance Management Act (No. 1 of 1999), the Preferential Procurement Policy Framework Act (PPPFA) (No. 5 of 2000) and the Municipal Finance Management Act (No. 56 of 2003). In addition to these is the Broad-Based Black Economic Empowerment (BBBEE) Act (No. 53 of 2003), which provides guidance on how public resources may be used as government acquires products and services.

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The South African SCM has been developed in line with the international public sector supply chain framework known as the Model Law on Procurement of Goods, Construction and Services (Matolong, 2015:122). Mhelembe and Mafini (2019:1) assert that it is widely acknowledged that public SCM is an important tool for the development of society through its contribution to both micro- and macro-economic development in the country. According to Mhelembe and Mafini (2019:3), the South African public supply chain continues to perform below expectations, which in turn limits the performance of the larger South African economy. The public SCM management process remains inhibited by numerous risks, constraints and pressures that include skills shortages, corruption and fraud, policy inconsistencies, management malpractices, political interference and dissatisfied stakeholders (Mhelembe & Mafini, 2019:3). The key stakeholders in SCM are public members, service providers and the media.

2.3.5.1 Challenges facing supply chain management in municipalities

Ambe and Badenhorst-Weiss (2016:11003) determine that according to the SCM policy accounting officers of government departments, management teams and other levels of staff need to have a sense of and understanding regarding values or principles entrenched in the legislative framework that affects SCM. A major challenge to SCM implementation is inadequate planning, considering that cost-effective procurement depends on specialist skills to ensure that buying requirements are reliably determined, appropriate contract strategies are developed, contracts are well managed and that there are opportunities to secure the best deal at the right time and the right price (Ambe & Badenhorst-Weiss, 2016:11003).

In spite of its fundamental contributions towards socio-economic development, public sector SCM in South Africa faces high levels of turbulence and uncertainty, as observed by various scholars (Mhelembe & Mafini, 2019:2) and indicates that public organisations in South Africa operate in a highly unstable environment, which is both volatile and imperfect, and tends to limit their performance.

According to the Auditor-General's 2016 report, only 5% and 9% of municipalities in the years 2011-2012 and 2013, respectively, had clean audit outcomes and in 2015, none of the municipalities in the North West Province had a clean audit. The Auditor-General report

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identifies that SCM plays a great role in poor audit outcomes such as irregular expenditure, lack of basic controls, as well as lack of supply chain skills.

The Chartered Institute of Procurement and Supply (2017) identifies government policies, supply complexity, availability of skills, supplier performance monitoring, information security and process efficiency as some of the most common supply chain risks in the public sector. The National Treasury Report on Public Sector Supply Chain Management Review (2015:1) identifies that SCM has been largely misunderstood and undervalued, its strategic importance has not been recognised and it has been under capacitated. The Review Report (2015:4) indicates that public SCM is imperfect and identifies the following challenges linked to SCM implementation and functioning in municipalities (National Treasury Report on Public Sector Supply Chain Management Review, 2015:4):

- The strategic importance of SCM is not well understood – those working within the system must ensure that they understand the economic and social power of the purchasing decisions that they make, as translating budget into deliverables requires an efficient public SCM system that is well resourced, functions efficiently and whose central importance is recognised.
- The organisational structure and systems within which SCM takes place are in too many cases not ideal, with inexperienced or under-skilled leadership, high staff turnover and lack of motivation.
- Lack of clarity about the role and responsibilities of technical staff turns political, which creates scope for interference and gives rise to allegations or instances of corruption.
- Lack of consequence management for those who fail to perform at the required level.
- Policies and regulations are often confusing and cumbersome.
- Underestimation of the importance of supplier management.

The risks identified have a negative impact on the success of the public sector supply chain. In addition to the above, Fourie (2015:40) adds that unethical conduct involving fraud and corruption are also contributing factors to the South Africa SCM process and its success. It is

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clear from the above that the South African public sector faces numerous internal and external risks and factors that limit the performance of its entire supply chain management.

Supply complexity is characterised by a dynamic supply market, unreliable suppliers and an unreasonably high number of suppliers with whom business is conducted, as determined by various factors that include political, economic, technological and social factors (Mhelembe & Mafini, 2019:3). The main relevant question to ask is how does the supply chain process return to normality after being affected by these dynamic factors, risk and turbulence and how flexible is the system to tolerate these factors?

According to Ellis, Shockley and Henry (2011:65), one area where the impact of these individual supply chain risks is highest is with respect to the flexibility of the supply chain, or the extent to which the supply chain can adapt and return to its normal state after being subject to turbulence. According to Mhelembe and Mafini (2019:4), SCM flexibility is the ability to respond to short-term changes in either the demand or supply situations of other external disruptions, coupled with the adjustment to strategic and structural shifts in the environment of the supply chain. Flexibility can be identified as key to responding to any challenges experienced within the SCM environment as it is concerned with the organisation's ability to effectively manage or react to changes with little penalty in time, cost or quality of performance (Agus, 2011:269). Supply chain management flexibility can be considered a solution for avoiding most of the common business disruptions by timely and responsive reactions to changes in the supply chain environment (Tang & Tomlin 2008).

2.4 TENSIONS BETWEEN THE MUNICIPAL SUPPLY CHAIN MANAGEMENT FRAMEWORK AND THE COMPLEX ORGANISATIONAL ENVIRONMENT

The legislative framework regulating supply chain management aims to create a uniform approach, process and activities of SCM. In this regard legislation has been identified as a barrier to SCM efficiency within municipalities. In this section of the research, factors incompatible with the SCM framework are identified. SCM management within municipalities is based on the framework depicted below.

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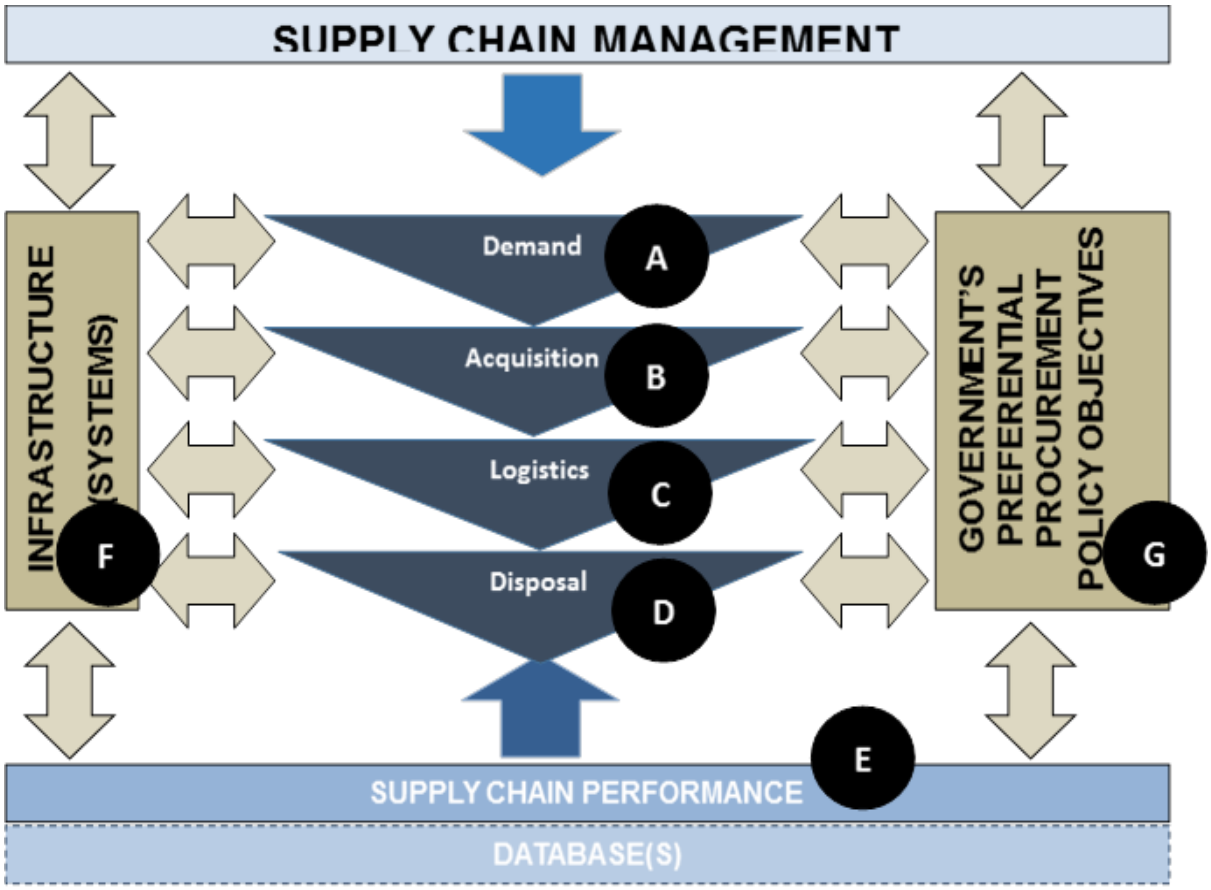

Figure 2.6: The generic elements of supply chain management

Source: RSA (2015:28).

The supply chain management framework consists of demand management, acquisition management, logistics management, disposal management and supply chain performance. Only two of the supply chain management elements are considered incompatible: demand management and acquisition management. Three of the categories are discussed below due to their direct reference and being key to the study..

A. Demand management as the first element of the supply chain management framework.

Ambe (2016:24) explains that demand management is aimed at fulfilling the needs identified during the strategic planning process. The total needs assessment should have been undertaken before the process can start and required resources must be analysed and assessed, with key

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elements in the demand management process being considered and the SCM practitioner being brought closer to the end users. Mafini (2016:257) argues that most organisations with acceptable practical strategies fail to implement their strategies because of the non-availability of critical resources.

Considering the above, the fact that municipalities are unable to undertake comprehensive planning as required and inform SCM demand management impacts negatively on the functioning of the next step. Complexity refers to the intricate interaction of systems with subsystems, whether internal or external. In this regard the internal systems do not respond according to the requirement of the demand management.

B. Acquisition management – the second element of the supply chain management framework.

Migiro and Ambe (2008:233) provide that acquisition management is the management of procurement whereby each municipality decides on the manner in which the market should be approached, establishes the total cost of ownership of assets, ensures that bid documentations are complete, including evaluation criteria, evaluates bids in accordance with published criteria and ensures that proper contract documents are signed (Republic of South Africa, 2003b). When considering this element, municipalities experience serious challenges, such as lack of internal capacity to undertake acquisition management from document preparation, evaluation of bids received and finalisation of award. The acquisition management requires the availability of internal resources to take the demand management process forward.

VUCA is an acronym used to describe a situation as being volatile, uncertain, complex and ambiguous. In this regard the SCM process, in particular the acquisition process, is certainly experiencing massive volatility and uncertainty relating to pricing and supply of goods. This is considered within the context of prices, changes in the market, supplier unreliability, and intricate delivery needs. This aspect of the complex environment affects SCM efficiency and service delivery expectations within municipalities. In this regard the process becomes more intricate as it is informed by the interaction of the SCM process with the external environment. The instability and uncertainty may impact the award stage with bidders not accepting the

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award and the municipality having to repeat the process or having to negotiate additional terms with the services. In recent experiences with JBMLM service providers who have accepted awards, the work has ultimately not been completed.

C. Logistics management

Ambe and Badenhorst (2012:6) explain that logistics management in supply chain management refers to the process of strategically managing acquisition, movement and storage of materials (inventory) through the organisation and its marketing channel in such a way that profitability is maximised through cost effective fulfilment of orders. Ambe and Badenhorst (2012:6) argue that logistics management forms part of the supply chain process that implements, controls and ensures an effective flow of stored goods and services.

Assessing the entire logistics management systems in local government, it can be identified that each municipality has its own logistics management approach unlike the other sphere of government where there is uniform system of logistics management. In the event that there is an absence of an information management systems in respect of logistics it becomes a clear indication that logistics management has not yet become an important tool for local government supply chain.

Considering that logistics management is the setting of inventory levels, coding of items, placing of orders, receiving and distribution, stores and warehouse management, expediting orders, transport, management and vendor performance, (Ambe and Badenhorst (2012:10), it is clear that logistics activities are not adequately reported and managed, and this set back municipality in respect of knowing their current stock at hand.

D. Disposal Management

(South Africa 2005a: 23) considers disposal management as the letting away of assets that are no longer needed, including unserviceable, redundant or obsolete assets. It gives due

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consideration to obsolescence planning, creation of a database of redundant material, inspecting material for potential reuse, determining a disposal strategy and executing the physical disposal process. Municipality are therefore required to ensure that they develop credible disposal strategies which directs the physical disposal process. In the process, a strategy aimed at consideration for reuse of equipment must be developed prior to considering disposal.

Municipality's as observed through the JB Marks Local municipality, the asset register still contain redundant assets valued at R1, which were required to have been disposed of year ago, and this affects the total asset management strategy of the municipality. In this regard it must be considered that within an asset register a separate section must be created containing a list of redundant assets.

E. Supply chain management performance

Supply chain performance is a monitoring process that performs a retrospective analysis to determine whether proper processes have been followed and whether desired objectives were achieved (Migiro & Ambe, 2008:234). Part of ensuring success of the SCM process is the continuous evaluation process. In the evaluation process it becomes key that municipalities, with their departments and sub-departments ensure analysis of the supply chain process takes place. In this regard, a normal and comprehensive process must be undertaken within the internal environment. It has been indicated above that the internal environment operates in an intricate way and therefore they may not be evaluated in a comprehensive self-critical way due to the fact that some sub-units within the municipality operate within a silo and see the supply chain as the internal enemy of their operational activities.

F. Infrastructure Systems

The National treasury SCM review (2015:33) identify that Reforms of infrastructure procurement systems and processes must be based on the Infrastructure Delivery Management System (IDMS). Infrastructure Delivery Management System (IDMS), is a standardised

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approach for planning, procurement, management and delivery of infrastructure aligned to South African legislation.

G. Preferential Policy Objective

Accordingly, Parliament approved the PPPFA in February 2000 to adhere to the requirement of the constitution, the act contains a framework for the application of preferences in the public sector bidding system. The preferences points system must be applied to all procurement. PPPFA and its associated regulations promote historical disadvantage individuals (HDI's) and a broad-ranging set of development objectives by means of allocating preferences points to these various policy objectives (South Africa 2005a: 37).

2.4 SUPPLY CHAIN MANAGEMENT IN COMPLEX ORGANISATIONS

According to Van der Waldt (2014:2), complexity theory thinking has been present in strategy and organisational studies since their inception as academic disciplines. Broadly speaking, complexity theory is used to understand how organisations adapt to their environments. The theory treats organisations as collections of strategies and structures. When the organisation shares the properties of other complex adaptive systems – which are often defined as consisting of a small number of relatively simple and partially connected structures – it is more likely to adapt to its environment and thus survive. The application of complexity theory to organisations offers an opportunity to consider various epistemological ramifications. McKelvey (2016:1) contends that complexity theory appears to be an important addition to organisation science that it is already being faddishly applied by the growing popular press and by consulting firms, and that it has essential roots in stochastic microstates, which have thus far been largely ignored.

SCM has existed for decades, yet it remains a challenge in public sector organisations. The management of organisations has grown from a command-and-results approach to strategically managing various complex functions of organisations. The day-to-day management of different departments within the organisation, particularly in the public sector, has become sophisticated and its efficiency has become blurred. The main challenge is the possibility that

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public sector organisations may be unable to identify and manage the complexity present in their organisations. Fitch and Jagolino (2012:594) present a simple argument that public sector service delivery organisations can increase their level of efficiency by increasing their resources in order to meet the demand for services.

Organisations are dynamic systems of adaptation and evolution that contain multiple parts which interact with one another and the environment, and the ability of organisations to change rapidly in response to intra- and interrelationships is at the heart of an adaptive organisation (Brown & Eisenhardt, 1998:281). 'Complex organisation' refers to organisations that in the organisational setup consist of intricate arrangements that can be identified through the departmentalisation of their operations and with SCM being a medium to small component of their structural composition.

Lissack (1999:110) argues that today's world is characterised by rising complexity and that institutional order is dissipating. The manufacturing process aimed at producing products and services in organisations is susceptible to a number of artificial and natural calamities. This vulnerability of the supply chain adds to the complexity of SCM in organisations and SCM as an organisational function.

Organisations are complex as a result of mounting pressure on them to deliver, innovate and transform, including a stringent demand for a differentiated organisational structure. Due to their structural nature and business process approach, complex organisations are required to adopt a natural and constant learning approach in order to adapt to the constant changes and consistent chaos effects. According to Hoole (2006, as cited in Gunasekaran, Subramanian & Rahman, 2015:6815), complexity makes a supply chain inflexible and inefficient as the more complex the supply chain is, the greater the possibility of failure.

SCM performance and success cannot be considered without examining the entirety of the organisation and its external environment. Local government is an organisation with an internal and external environment. SCM remains a support function in the organisation or municipality. In the municipality considered in the case study, SCM functions are rendered by subsections based within the finance directorate and SCM is a support function for the entire municipality.

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The literature shows that organisations' complexities exist because of the internal and external environment that has an impact on their performance and success. Municipalities exist as organisations, with the external environment impacting on their success. Accordingly, it has been established that organisations are open systems that are dependent on their external environment. Local government operates like a system with its internal function mechanisms and the external environment. Complex systems consist of mechanisms that are interconnected, interactive and interdependent. Systems operation is difficult to define, comprehend, forecast, manage and design.

Complexity theory suggests that an organisation is complex when its situation becomes unpredictable. Local government has proven that its environment is unpredictable; one day the municipality is doing well, the next moment something emerges to the extent that in the end, self-organisation kicks in and the chaotic situation becomes acceptable and the situation is back to normal.

The provision of SCM functions in municipalities has become complex. The external environment and the internal functioning of municipalities have become totally dependent on SCM for survival and success. SCM is influenced in its success by market forces through prices, delivery challenges and direct turmoil from the external environment, in this regard service providers prey on the municipality through the SCM process. The internal environment has specific and direct demands, including expectations. This is because municipalities are organisations operating as systems with unpredictable outcomes, in particular regarding supply chain functions.

In responding to the question of whether SCM can work in complex organisations and what is the effect of complexity on the functioning of SCM within organisations, complex organisations, as indicated above, are influenced by the functioning of the organisation as a system. The external environment plays a key role in the functioning of the organisation. It has therefore become clear that a complex organisation suffers from permanent instability that is corrected mainly through self-organisation. This instability and chaos are made worse by the fact that the organisation is influenced by the VUCA concept, which affects the functioning of SCM and the organisation.

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2.5 CONCLUSION

This chapter focused on complex organisations and SCM and its implications for the organisation. SCM as a concept was discussed, with reference to its various definitions, origin, purpose and importance, and total linkage within the organisation.

Complexity theory was used to define complexity and complex organisations. Complexity theory was defined, and its characteristics outlined. Complexity theory allows a different approach in understanding and providing solutions to challenges facing the organisation. The theory, according to Cleveland (1994:2), suggests that a vibrant democracy is an 'edge of a chaos' form of government, a healthy market is an 'edge of chaos' form of economics, a flexible and adaptive organisation is an 'edge of chaos' institution and a mature, well-developed personality is an 'edge of chaos'. Hiett (1999:127) the edge of chaos refers to a transition space between order and disorder that exists within a wide variety of systems and the transitional zone bound by instability that engenders a constant dynamic interplay between order and disorder. According to Beinhocker (1997:35), between these extremes of stasis and chaos lies a region where fitness is maximised Being at the edge of chaos does not mean pursuing a moderate level of change, but something more subtle. At the edge of chaos, one is simultaneously conservative and radical.

Many organisations today are locked in a rigid order and incapable of adaptable evolution, for example bureaucracies, monopolies and dictatorships. Cleveland (1994:2) states that in some sectors of society we can see migration from both the extremes of incoherent chaos and rigid order towards the middle edge of chaos by adopting the complexity theory approach whereby organisations have the capacity to grow, learn and evolve.

Complexity and complexity theory define organisations today. The differentiation in structure, authority and locus of control are key considerations aimed at positioning the organisation against massive instability and chaos. Local government is facing survival challenges and therefore is required to adopt survival strategies in order to remain relevant and efficient.

Organisations facing the challenge of survival and relevance are best placed on the edge of chaos within the understanding of complexity theory in that within the parameters of the organisation, the edge of chaos is where life occurs. Organisations must seek parameters that

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will produce an emergent structure that lives on the total edge of chaos and local government must seek these parameters in anticipation of new possible solutions to all its problems.

In this chapter, SCM was confirmed as a function that is interlinked and interdependent with other organisational responsibilities. It is, in fact, confirmed as a support function that at times is a leading function on its own. The chapter reveals that a nexus exists between the functioning of SCM and the dynamics of the internal and the external environment, impacting directly on the functioning of SCM systems and processes.

The chapter highlights the need for public sector organisation management to understand the purpose, importance and total functioning of SCM. Those at the receiving end of SCM services should keep abreast of the ins and outs of the SCM unit to understand its challenges, in particular the impact of organisational complexities on SCM, including the impact of the external environment. SCM functions within the organisation, in particular public sector organisations, are part of the medium used to deliver services and therefore play a critical role to ensure accelerated quality service delivery as required by the community.

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CHAPTER 3: LEGISLATIVE FRAMEWORK PERTAINING TO PUBLIC SECTOR SUPPLY CHAIN MANAGEMENT IN SOUTH AFRICA

3.1 INTRODUCTION

This chapter focuses on providing the legislative requirements in respect of SCM within public sector organisations. A broad overview is provided from a national perspective, narrowing to the local government organisation on which the research is centred. The chapter begins by looking at the overall government SCM guide pre- and post-1994, and an outline is provided in respect of the local government legislative framework relevant to the case under study.

Public sector procurement and procurement practices are guided by a long list of legislative directives and reforms that aim to ensure that the public sector SCM process achieves its intended purpose. Legislation in South Africa is a product of national, provincial and local government, and is directed by the general inputs and consensus of the electorate who, by virtue of participating in elections, directly and indirectly provide input on the structure and content of government policy and legislation.

The South African government's SCM approach provides an added context to the supply chain. The generic elements are depicted in Figure 3.1 and act as a general guide to the legislative framework and reforms.

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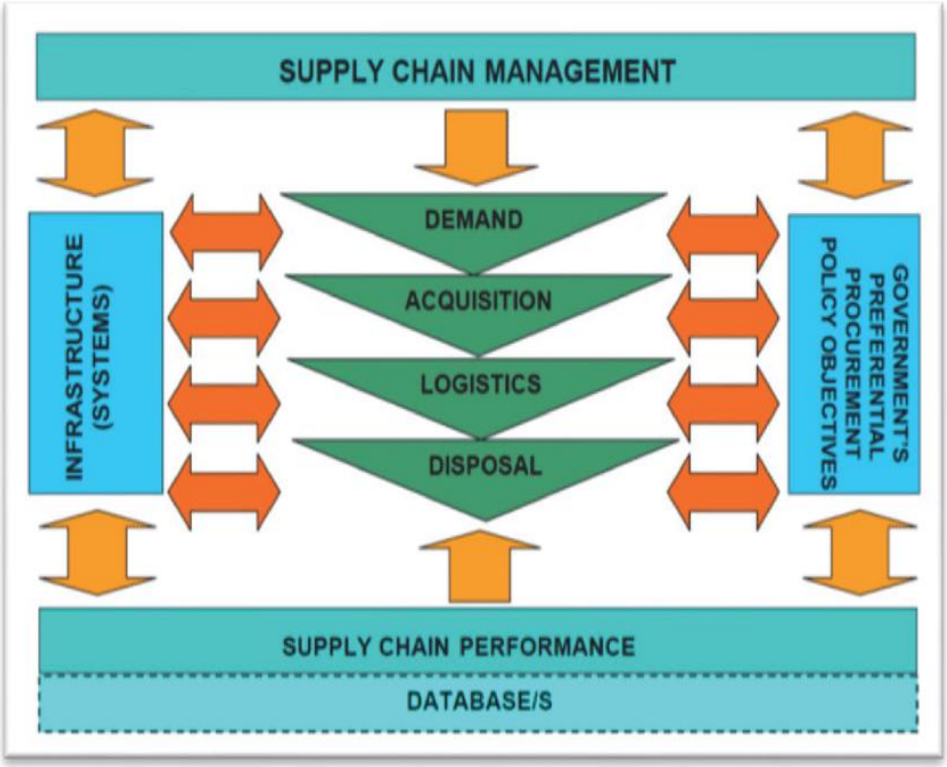

Figure 3.1: National Treasury supply chain management principles

Source: RSA (2015:28).

SCM is about demand, acquisition, logistics, disposal and performance management. A SCM policy must provide for an effective system of demand management in order to ensure that the resources required to support the strategic and operational commitments of the government entity are delivered at the right time, price and location, and that the quantity and quality satisfy the needs of the municipality or municipal entity.

Acquisition management lays out the requirements for an effective acquisition system that will ensure goods and services are sourced accordingly and comply with the internal processes of the government entity, such as budgeting, and will ensure acquisition is generally compliant with regular government-wide requirements. Logistics and disposal management calls for comprehensive inventory management and guidelines on how to dispose of any inventory.

SCM involves providing for a comprehensive system of goods acquisition and disposal. The next section considers the development of the SCM legislative framework pre- and post-1994.

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3.2 THE SOUTH AFRICAN PRE-CONSTITUTIONAL PROCUREMENT PERSPECTIVE

As a move away from the old system of the apartheid period, the pre-constitutional perspective provided for an interim guide on managing procurement. The measures introduced aimed to ensure inclusivity with regard to government procurement, which is a move away from the segregated approach to procurement.

Section 217(1) of the Constitution states:

> *The procurement of goods and services for any level of government shall be regulated by an Act of Parliament and provincial laws, which shall make provision for the appointment of independent and impartial tender boards to deal with such procurements.*
>
> *(2) The tendering system referred to in subsection (1) shall be fair, public and competitive, and tender boards shall on request give reasons for their decisions to interested parties.*

The interim measures were an introduction to the future measures that came with the adoption of the Constitution, and which are discussed below.

3.3 THE SOUTH AFRICAN POST-1994 PROCUREMENT PERSPECTIVE

The Constitution of the Republic of South Africa, as adopted on 4 February 1997 (RSA, 2006), extends the Interim Constitution's requirement that a national parliament make provision for legislation governing the extension of Chapter 13, section 217 of the Constitution, considering the strict requirements by the Constitution in respect of public procurement.

Indirectly, Chapter 3 of the Constitution of the Republic of South Africa, which calls for intergovernmental relations including corporative governance, provides for strict regulatory

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relations within the three spheres of government and this requirement gives local government no escape from ensuring direct accountability and compliance in building national unity.

3.4 STATUTE TIMELINE IN RESPECT OF PUBLIC SECTOR SUPPLY CHAIN MANAGEMENT IN SOUTH AFRICA

The National Treasury Public Sector Supply Chain Management Review Paper (RSA, 2015:9) states that there are more than 80 different legal instruments governing public sector SCM, including the following:

- The Constitution of the Republic of South Africa, section 217, which addresses the basic constitutional requirements of public procurement, supported by section 33 on administrative action and section 195, which lays out the constitutional values for public administration.
- The Public Finance Management Act, No. 1 of 1999.
- The Preferential Procurement Policy Framework Act, No. 6 of 2000.
- The Broad-Based Black Economic Empowerment Act, No. 53 of 2003(b)
- The Local Government Municipal Finance Management Act, No. 56 of 2003(c)
- The Prevention and Combating of Corrupt Activities Act, No. 12 of 2004.
- The Construction Industry Development Board Act, No. 38 of 2000.
- The National Land Transport Act, No. 5 of 2009.
- The National Suppliers Procurement Act, No. 89 of 1970.
- The State Information Technology Agency Act, No. 88 of 1998.
- The Financial Management of Parliament Act, No. 10 of 2009.
- The Road Traffic Management Corporation Act, No. 20 of 1999.
- The Armaments Corporation of South Africa Limited Act, No. 51 of 2003 (a)
- The Administrative Adjudication of Road Traffic Offences Act, No. 46 of 1998.
- The Nursing Act, No. 33 of 2005.
- The Public Audit Act, No. 25 of 2004.
- The Health Profession Act, No. 56 of 1974.
- The Housing Act, No. 107 of 1997.

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- The Disaster Management Act, No. 56 of 2002.
- The Promotion of Access to Information Act, No. 2 of 2000.
- The Promotion of Administrative Justice Act, No. 3 of 2000.
- The Local Government Systems Act, No. 32 of 2000.

The core of the legislative framework is described below.

3.4.1 Constitution of the Republic of South Africa, 1996

The Constitution sets the tone of the requirements to which public sector procurement must adhere, and in that respect it identifies various principles aimed at addressing procurement in Chapter 13, section 217, which are an extension of the interim measures considered above. The Constitution introduces general and open measures on how to handle procurement and calls for legislation providing special measures on procurement. This led to the formulation of the Public Finance Management Act (No. 1 of 1999) and the Local Government: Municipal Structures Act (No. 117 of 1998), which are detailed below.

3.4.2 Local Government: Municipal Structures Act (No. 117 of 1998)

Further to the establishment of municipalities by the Constitution, the Municipal Structures Act (No. 117 of 1998) gives effect to the structures within local government and prescribes powers and functions in respect of each structure that it established. Important to the process of procurement is requirements by legislation with regard to municipal councils' responsibilities, which include prioritising the municipalities' priorities and service delivery mechanism in order to meet the needs of the community. The Act makes provision for additional regulations and a legislative framework in addressing matters as excluded by the Act.

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3.4.3 Public Finance Management Act (No. 1 of 1999, as amended)

The Public Finance Management Act (No. 1 of 1999, as amended) provides for the matters identified in Chapter 13, sections 216 and 217 of the Constitution. The Act was not sufficient on its own in addressing all procurement matters and called for further regulatory guidelines. Thus, the Preferential Procurement Policy Framework Act (No. 6 of 2000) was introduced.

3.4.4 Preferential Procurement Policy Framework Act (No. 6 of 2000)

The Constitution makes provision under section 217 that organs of state may implement a procurement policy that addresses categories of preference in the allocation of contracts. It also addresses the protection of persons or categories of persons from being disadvantaged by unfair discrimination and requires that national legislation prescribe a framework and policies for implementation.

The preferential procurement policy introduces a preference point system to be followed by all public sector organisations and provides various categories of rand values to be considered during each approach. The preference point system contains prescribed formulas for consideration in order to address contracting with persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender or disability and implements the programmes of the Reconstruction and Development Programme (Republic of South Africa, 2000f).

Considering the above regulatory framework, it is clear that procurement is addressed through various pieces of legislation. No single legislation is an end in itself in respect to procurement. In order to understand procurement, one must therefore understand these multiple legislations and regulations.

3.4.5 Treasury Regulations (2001)

The Treasury Regulations were issued in terms of section 76 of the Public Finance Management Act and deal with a wide range of financial management issues. In addition, they refer to and deal with procurement issues, including parts that provide specifically for

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expenditure management, which is directly linked to procurement. Government legislation is not one-size-fits-all, in particular considering local government, thus the Municipal Systems Act (No. 32 of 2000) was introduced.

3.4.6 Municipal Systems Act (No. 32 of 2000)

The Municipal Systems Act (No. 32 of 2000) provides for the core principles, mechanisms and processes necessary to enable municipalities to move progressively towards the social and economic upliftment of local communities, and to ensure universal access to essential services that are affordable to all, including the manner in which municipal powers and functions are exercised and performed. It addresses matters related to community participation via the establishment of a simple and enabling framework for planning, performance management, resource mobilisation and organisational change, which underpin the notion of developmental local government. Lastly, it introduces competitive bidding under section 83 of the Act.

The competitive bidding requirement ensures that the local government bidding process is competitive, fair, transparent, equitable, cost-effective and open to all South Africans. The principles emanating from this legislation are aimed at addressing the possibility of fraud and corruption and ensuring that local government is accountable and open to its community.

This legislation is not an end in itself, and in its application consideration must be given to other applicable national legislation. In this regard, the Municipal Finance Management Act, considered below, was born to give effect to the requirements relating to the management of financial matters within municipalities.

3.4.7 Municipal Finance Management Act (No. 56 of 2003)

The Municipal Finance Management Act (No. 56 of 2003) aims to ensure safe, secure, sound and sustainable management of the fiscal and financial affairs of municipalities and their related entities by introducing norms, standards and other requirements. These support transparent, accountable and appropriate lines of responsibility, including management of revenue, expenditure, assets, budget, planning, borrowing, SCM and other associated matters.

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The Act calls on municipalities to implement SCM policies that give effect to the requirements of the Act. Immediately after this Act had been signed into law, municipal SCM regulations were gazetted. The regulations are a one-size-fits-all approach for all municipalities, and compliance is not negotiable.

3.4.8 Municipal Supply Chain Management Regulations

The Municipal SCM Regulations provide a detailed and direct guide as an extension of the Constitution and the Municipal Finance Management Act. The regulations provide a break from the requirements of section 217 of the Constitution and offer details as to how a fair, equitable, transparent, competitive and cost-effective SCM process should be implemented and achieved. The regulations make a distinction between the supply chain line functions and call for a system that provides for demand management, acquisition management, logistics management, disposal management, risk management and performance management.

3.4.9 Public Sector Supply Chain Management Review (2015)

In his 2015 Public Sector SCM Review, the Director-General of the National Treasury stated the review was a candid reflection on the current state of SCM in the public sector, reforms that were being considered and opportunities that an efficient and effective system presented.

The review reflects the view that public sector SCM is disorganised and has an element of fragmentation, and therefore the reform is aimed at bringing about synergy in public sector SCM. Public sector procurement regulation is contained in almost all legislation. It is important to note that some legislation's primary purpose does not concern procurement while the legislation may contain some provision relating to public sector procurement. This indicates the importance of compliance in respect of SCM as a procurement approach in South Africa.

SCM legislation and its presence in other regulations results in much red tape for public sector procurement. This red tape contributes to the complexities that local government is operating under today, thus there is the need for a comprehensive review.

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3.5 FACTORS IN THE SUPPLY CHAIN MANAGEMENT LEGISLATIVE FRAMEWORK CONTRIBUTING TO THE INCOMPATABILITY OF SUPPLY CHAIN MANAGEMENT

The literature reviewed in Chapter 2 identifies that there is a relationship between the performance of supply chain management and factors impacting negatively on SCM within municipalities and the public sector. The literature indicates that supply chain management in South African municipalities and the public sector is facing turbulence, uncertainty and operates in a highly unstable environment, which is both volatile and imperfect, and tends to limit their performance. In addition to these factors there are other internal environment factors which negatively impact on supply chain management functions, and which involve, fraud, corruption and misrepresentation.

As mentioned, SCM in municipalities operates in a highly unstable environment, which limits their performance. There is correlation between VUCA (volatile, uncertain, complex, and ambiguous) phenomenon and what supply chain management in local government has become. This influences the delivery of services in municipalities. According to Mhelembe and Mafini (2019:4), many South Africans do not trust the SCM processes in the public sector, and the general perception is that the public sector is failing to fulfil its mandate due to systemic problems in the entire public supply chain. The presence of complexity refers to the interplay between the system, its subsystem and immediate environment. It has been identified in chapter two that the external environment directly impacts the functioning of SCM and thus affects its efficiency, including the overall service delivery of municipalities.

It is clear from the literature review that supply chain management legislation does not recognise that the environment in which supply chain management is to be implemented is full of uncertainty, volatility and complexity, nor does it recognise the challenges in the implementation of supply chain management. While supply chain management legislation provides for some level of discretion for municipalities to develop their own customised policy, this must be in line with national and provincial legislation. Supply chain management legislation is rigid and does not allow for any level of flexibility to cater to the effect of the external environment including on the internal environment and the implementation and functioning of supply chain management. SCM in municipalities must adapt to the demand of its internal and environment.

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3.6 CONCLUSION

This chapter focused on the legislative framework relating to public sector SCM, and in this regard a statutory framework for the implementation of SCM was discussed. The core elements of public sector SCM were highlighted. Prior research indicates that within all the statutory frameworks, the implementation of public sector SCM, in particular in the local government sphere, remains a major challenge.

Local government is complicated due to its legislative mandate, structural reorganisation and overall business process. It operates within the overall system of government and is determined by the cooperative nature of governance, as described in Chapter 3 of the Constitution. The nature of cooperative governance results in the national and provincial spheres' exercising their legislative authority on local government, resulting in massive overall regulation of local governance. This overregulation of SCM results in serious administrative red tape, contributing to the level of complexity in local government. The legislation demands that local government must be developmental in nature and that it must operate within the limits of cooperative and intergovernmental relations; this leads to a complex environment for local government in South Africa. Chapter 2 of this thesis states that the purpose of SCM is to bring about efficiency and effectiveness in the supply chain process, while the public sector supply chain is all about compliance with the dictates of national and provincial spheres of government, bringing about gross limitations to the functioning of SCM within local government and misdirecting the total purpose of SCM within the South African public sector. SCM has moved away from its objective existence since becoming a compliance factor and become complicated to implement.

The multiple legislations within local government indicate that national and provincial government are erring in their legislative framework on local government. The numerous legislations create frustration and confusion for local government, and this contributes to the overall challenge of complexity in local government.

Local government is required to address its challenges relating to the implementation of SCM. In doing so, it must ensure that an opportunity is provided by legislation to ensure that local government can introduce innovation aimed at addressing the complexity challenge. A one-size-fits-all approach to the implementation of SCM with no space for input, flexibility and

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innovation is provided through legislation in local government. This lack of input from local government is directly opposed to the absorption of complexity and negates the self-reorganisation necessary for a complex organisation.

Since it is clear that current legislation is not achieving its intended purpose, some consideration must be given to possible new ground-breaking legislation containing all prescriptive requirements and taking into consideration the complex nature of local government functioning. The need for review of SCM within local government cannot be wished away. The theoretical and legislative framework provided in this chapter indicates a diversity of legislations, which to some extent are aimed at achieving the same result. These must be consolidated and simplified to ensure a holistic legislation for SCM in local government in South Africa.

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CHAPTER 4: JB MARKS LOCAL MUNICIPALITY – A CASE STUDY

4.1 INTRODUCTION

In the preceding chapter, a detailed outline was given of the current legislative framework on SCM, and a conclusion was drawn that the constant changes to the SCM legislative framework are an indication of the difficulty that the public sector has had in making SCM relevant and workable within the public sector. This challenge is influenced by the fact that local government in its entirety is a complex organisation, which is explained through complexity theory. This chapter explores JB Marks Local Municipality, its location, its importance to the study and the total functioning of SCM in the municipality.

4.2 OVERVIEW OF JB MARKS LOCAL MUNICIPALITY

The Constitution of the Republic of South Africa provides for the establishment of local municipalities within three distinguishable categories: Category A municipalities have exclusive municipal executive and legislative authority in their area; Category B municipalities share municipal executive and legislative authority in their area with the Category C municipalities within whose area they fall; and Category C municipalities have municipal executive and legislative authority in an area that includes more than one municipality. JB Marks Local Municipality is a Category B municipality as it shares municipal executive and legislative authority with a Category C municipality within whose area it falls.

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Figure 4.1: Geographical location of JB Marks Local Municipality

Source: www.municipalities.co.za.

JB Marks Local Municipality was established after the disestablishment of Ventersdorp Local Municipality, which was merged with the former Tlokwe City Council after the fifth democratic local government elections held on 3 August 2017. The population of the former Ventersdorp Local Municipality was determined at 56 702 during the 2011 census and estimated to be 63 923 in 2018, with the Tlokwe City Council population recorded as 16 762 during the 2011 census and estimated at 192 201 in 2018. According to the Municipalities South Africa website (n.d.), the estimated population of the newly established municipality is 243 527.

The former local municipalities had separate operations prior to the merger, with separate councils and administration with departmentalised systems, and with SCM being one of the

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functions and responsibilities. The merged and newly established local municipality adopted the name of JB Marks Local Municipality, and its new head office is situated in Potchefstroom. The municipality took on a regional approach in its operations, with the two former municipalities becoming known as Potchefstroom, or Tlokwe Region and Ventersdorp Region. The two former municipalities, according to the acting Chief Financial Officer of JB Marks Municipality, were quite different in their financial management audit outcomes. The former Ventersdorp Municipality's last unqualified audit opinion was in 2000, while the former Tlokwe City Council's unqualified audit opinion was in 2015. Tlokwe City Council was previously regarded as one of the top ten municipalities as per Ratings Afrika (2012).

4.2.1 JB Marks Organisational Overview

The organisational structure as approved during 2017, after the merger of the two municipalities, details the following directorates in JB Marks municipality: corporate services, municipal services, local economic development services, community services, financial services and technical services. The directorate of financial services incorporates the division of SCM, with subdivisions of SCM performance and compliance, SCM, transport and assets, and disposal management.

The municipality has departmentalised its functions and grouped them according to their relatedness, forming specialised units that contribute to the total functioning of the organisation. This functioning is via subsystems that are contributing towards the total system with the same objectives.

4.2.2 JB Marks Supply Chain Management

JB Marks Municipality has a full complement of SCM units that form part of the bigger municipal treasury department with other related functions such as budgeting. The SCM units of the municipality have a support function that is decentralised and which supports all other departmentalised functions in the municipality. The SCM units of the municipality can be seen as subsystems that are dependent on the overall existence of other functions to exist. The subsystems therefore must consider the life of the total organisation in order to ensure that

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procurement and post-procurement activities take place and that the organisation, with all its complexities, is functional as a global system.

4.2.3 Level of Complexity of JB Marks Local Municipality

Like all other municipalities, JB Marks Local Municipality is not immune to current challenges facing local government. These challenges that impact directly on the functioning of local government are to a large extent shared by other spheres of government. In this regard, aspects such as globalisation, process reengineering, information revolution, diversity and some organisational reforms affect the functioning of local government in South Africa, thus JB Marks Local Municipality is also affected. In light of the above and considering that local government functions as a system and that SCM forms part of the system, local government has a role to play in addressing internal function complexities.

Axelrod and Cohen (1999:15) posit that what happens to complexities in organisations depends on what we do with them. How we understand these complexities informs how we deal with them. JB Marks is experiencing a high level of complexity, in particular due to its external environment. The amount of differentiation within the organisation defines its complexities. JB Marks Local Municipality has great differentiation in terms of its organisational mandate and its structural reorganisation. The known level of complexity within the municipality, with serious compliance deficiencies from an audit perspective, shows that the municipality is at the random state far from the natural state of equilibrium.

4.2.4 Supply Chain Management Functioning within JB Marks Local Municipality

SCM is about all the role players within the supply chain and the management of this chain with the aim of delivering the required product at the right place, time, quantity and price (Ali & Habib, 2012:35). Public sector SCM is about direct supply chain control and management, with JB Marks Local Municipality being no exception.

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Public sector SCM is about meeting the minimum requirements of the SCM legislative framework, and this excludes management of the product chain. JB Marks Local Municipality does not have a complete functional SCM unit as required by legislation. It is observed that the implementation of SCM in municipalities appears to be experiencing serious challenges, identified in its initiative stages to the current stage of implementation. Local government SCM is a failed initiative and has not gotten off the ground. The municipality has no direct control of the product, even though conventional SCM places such an obligation on an organisation.

JB Marks' SCM, as a public sector practice, is informed by a legislative framework, including various factors external and internal to the organisation. In this regard, while public sector SCM has no direct supply chain control and management function, these organisations still experience the same level of impact and influence from their internal operations, including the external environment, which asserts massive pressure on the regulatory environment, including the internal environment, of local government.

In this regard, and in light of the challenges experienced, local government in South Africa can make use of the complexity theory approach in order to gain a deeper understanding of its own operations and environment. This will enable it to provide for new interventions in the setup of its overall system.

4.3 CONCLUSION

South African public sector SCM, particularly in local government, is still in the developmental stage, considering that SCM practices in municipalities are not fully implemented and developed. Local government is still struggling to understand and comply with the requirements and rules pertaining to SCM as set out by national and, in some instances, provincial government.

JB Marks Local Municipality's organisational functioning – including SCM – experiences the same level of exposure and difficulty as private entities that have a SCM and control function. In this regard issues such as price fluctuations and instability, price exchange, political instability and to some extent political interference all impact on SCM. JB Marks Local Municipality as an organisation has undergone various changes, from transformational to

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demographical, as well as internal strategic amendments, and with the merger of the two former municipalities the new municipality has experienced great challenges in having to combine two independent institutions to form one entity. The identified challenges, including constant changes to the SCM regulatory environment, have brought about more red tape than ever for local government systems and increased the level of complexity in local government.

When one examines the requirements of SCM in the literature, the deduction is that public sector organisations, and particularly municipalities, are nowhere near managing a supply chain effectively. As indicated in the case study, the organisational structure of local government does not respond to the totality of directly managing a supply chain, but a rather only to a mere chain interaction.

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CHAPTER 5: EMPIRICAL RESEARCH – RESULTS AND FINDINGS

5.1 INTRODUCTION

As indicated in Chapter 1, this study is focused on the complexity problems affecting the functioning of SCM within a public sector organisation. It also considers the lack of comprehensive policies and the complex nature of public sector organisations, in particular local government.

The literature review on the supply chain, SCM, complexity theory and local government supply chain management provides a clear review of SCM and complexity theory. The literature review indicates the ideal conditions for a full-steam implementation of the supply chain and SCM. Considering local government as an organisation and bearing in mind its challenges, systems and the internal and external environment, the literature review on complexity theory and complex organisations describes what complex organisations are and what characteristics they exhibit. When these characteristics are compared to local government, it indicates local government is in a complex phase and that this complexity impacts negatively on the current policies that regulate SCM in municipalities.

In this chapter, the results obtained in the study by means of the self-administered questionnaire as a data-collection instrument are revealed and interpreted. The aim of the empirical investigation is to determine whether shortcomings identified in the literature review are really present within the local government sector and particularly within JB Marks Local Municipality. Is important to note that the questionnaire did not attempt to measure any correlation between variables and instead aimed to determine to what extent and why stakeholders think that the particular organisation is a complex organisation and that the features are therefore confirmed.

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5.2 BIOGRAPHICAL INFORMATION

The research was conducted by means of a self-administered questionnaire. Eighty-one participants completed the questionnaire (Annexure B). All participants were residents or employees of JB Marks Local Municipality and/or employees of the Office of the Auditor-General. Forty-two participants are employed by the municipality. At the time of the study, eighteen are middle to senior managers (employment levels 0-6), nineteen are supervisors (employment levels 8-10) and five are SCM unit officials. Twenty-nine participants are community members of the JB Marks local municipality (from both the Potchefstroom/Tlokwe and Ventersdorp regions), nine are councillors at the municipality and one is a representative from the Office of the Auditor-General.

The results obtained from the questionnaire are provided according to three different categories: SCM, local government complexity and SCM in complex organisations. The questionnaire is divided into two sections: Section A constitutes the biographical component of the questionnaire and was completed by all participants, and Section B deals with questions relating to SCM in complex organisations such as JB Marks Municipality. The questions in Section B are divided into six categories (A, B, C, D, E and F).

Category A of the questionnaire was completed by JB Marks employees of levels 0-6, who are middle to senior management responsible for tactical strategies in the municipality. It is their responsibility to ensure that SCM contributes towards, and does not detract from, the strategic objectives of the organisation.

Category B of the questionnaire was completed by JB Marks employees of levels 8-10, who are operational employees with functional responsibilities within the municipality. It is their job to ensure SCM is carried out in a manner consistent with the operational mandate provided through the Integrated Development Plan, Medium-Term Revenue Expenditure Framework (MTREF), Service Delivery and Budget Implementation Plan and other instruments provided by law and regulations that navigate the complexities of local government.

Category C of the questionnaire was completed by JB Marks Local Municipality councillors who serve as the board of directors of the municipality and are responsible for the total functioning of the municipality. It is their responsibility and function to provide political

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oversight of the strategic objectives and to approve the tactical approach and the operations of the municipality.

Category D of the questionnaire was completed by all participants of the study. Category E was completed by community members of JB Marks Local Municipality from both regions of the municipality (Potchefstroom/Tlokwe and Ventersdorp). This category represents the most important stakeholder group as they have expectations about services and perceptions about the success of the organisation in fulfilling their expectations.

Category F of the questionnaire was completed by a representative from the local Office of the Auditor-General in Potchefstroom. The Auditor-General has a responsibility to expresses an objective and independent opinion of the capacity and compliance of the municipality and plays a stewardship role in respect of all public assets.

The biographical section of the questionnaire requests participants indicate their employment level, years of experience and qualifications. The purpose of obtaining the biographical information is to ensure a diverse complement of participants (municipal employees, councillors, community members and a representative of the Auditor-General) complete the questionnaire. A diverse group is important to the research to ensure a balanced view pertaining to complexity and how it impacts on SCM. The results obtained through the biographical section of the questionnaire are indicated in the sections below by means of figures.

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5.2.1 Employment Levels

These differing employment levels are indicated in the figure below.

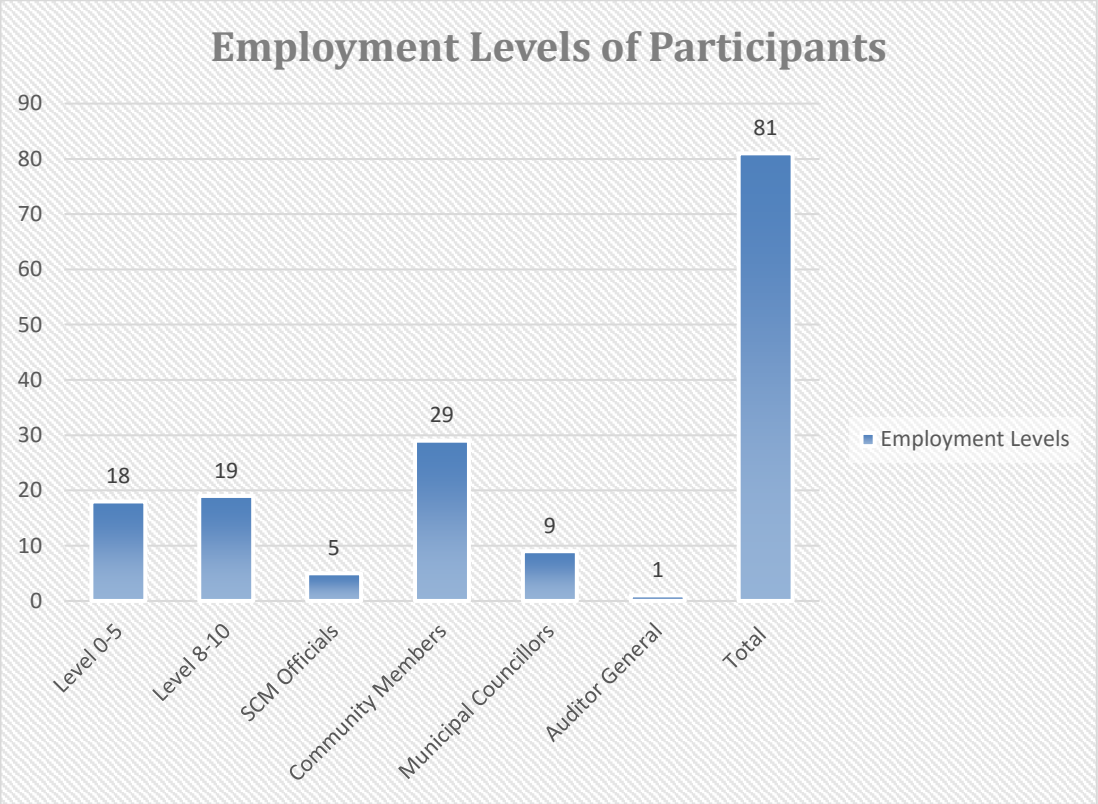

Figure 5.1: Grouping of participants according to employment levels

From the above, it is evident that the study considers a fair distribution of participants, with eighteen at senior to middle management level, nineteen at operational or supervisory level, five in the SCM unit, twenty-nine community members, nine municipal councillors and one representative from the Office of the Auditor-General. The profile of the participants is adequate for a balanced perspective in relation to complexity and its impact on SCM.

It is important to indicate that the assessments and inputs by the 51 participants who are senior and middle managers and councillors are valuable given their responsibility in the municipality, with senior and middle managers having the duty to guide and inform their subordinates. The municipal council also plays a critical role with regard to oversight of SCM activities, including

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the fact that the councillors represent people who have an expectation that municipal councillors will protect their interests and ensure that their needs are met. Five operational employees responsible for the daily SCM activities participated in the study, with the intention of sourcing their operational perspectives on SCM in their internal and external environment.

5.2.2 Experience

The section on work experience in the biographical section of the questionnaire reveals that 42 participants are employed by JB Marks Local Municipality. Of these, six participants have less than five years' experience, fourteen have been employed by the municipality for a period of six to ten years, nine participants for eleven to fifteen years and thirteen participants have been employed for more than 16 years, as indicated in Figure 5.2. below.

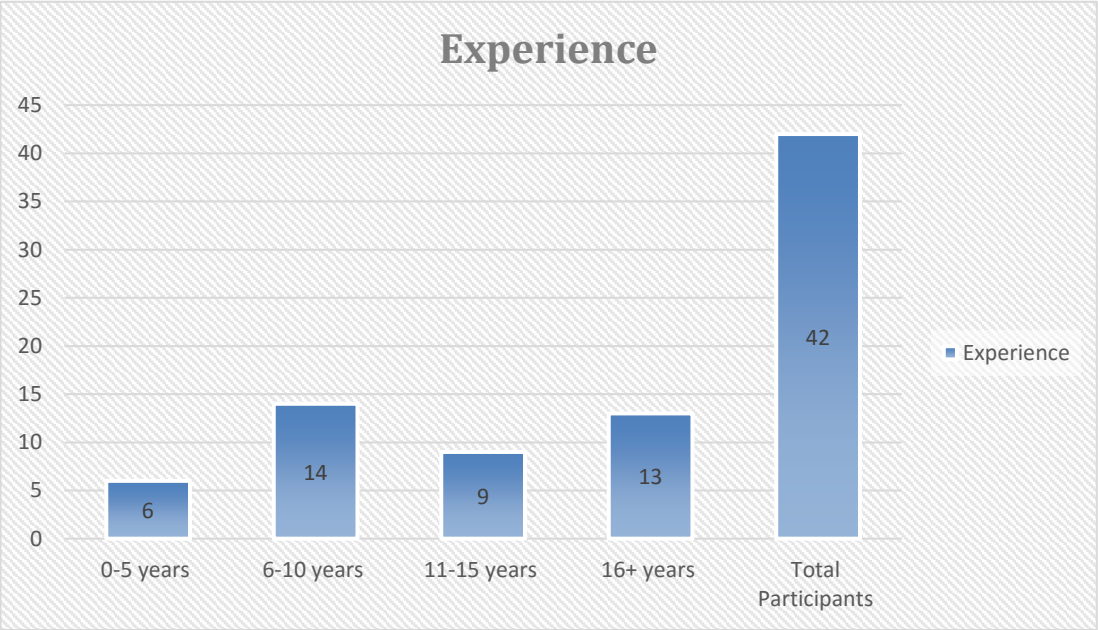

Figure 5.2: Grouping of participants according to experience

The majority (twenty-two participants) have been employed by the municipality for a period exceeding ten years, and twenty have been employed for less than ten years. All employees,

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irrespective of tenure, should be aware of the existence of SCM and its application in the municipality and should therefore be able to provide a specific perspective on the functioning of its SCM units. This indicates that there is a lack of experience and insight regarding navigating the complexities within the municipality and the complications of SCM.

5.2.3 Qualifications

This part of the questionnaire revealed that thirty participants have a qualification equal to or below matric, twenty-five have diplomas, nine have a bachelor's degree NQF Level 7 and ten are postgraduates with NQF levels 8 and 9 qualifications in their respective fields, as shown in Figure 5.3 below.

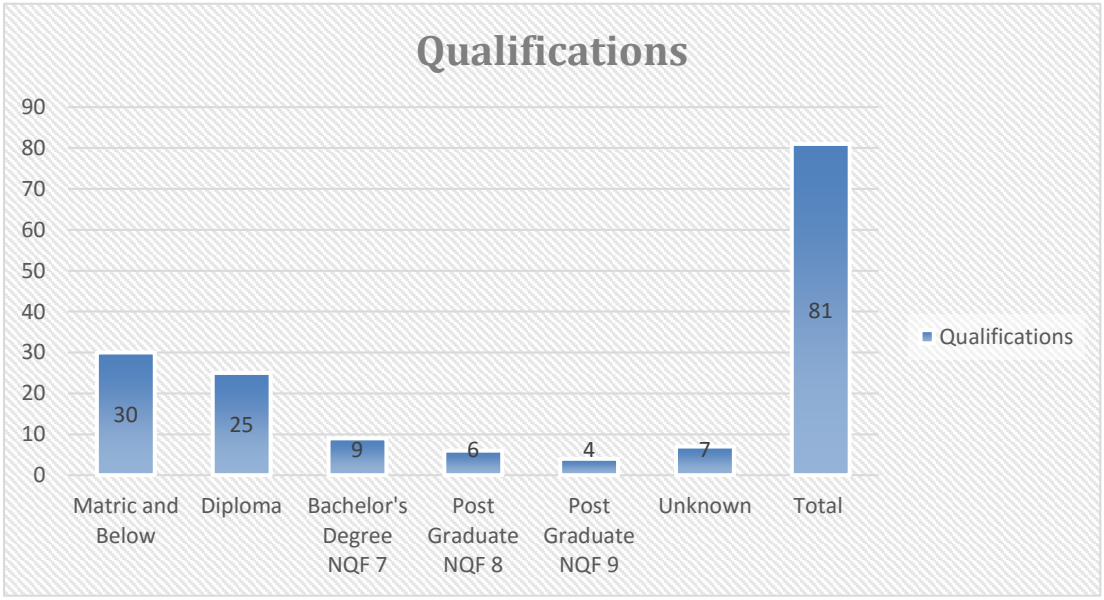

Figure 5.3: Grouping of participants according to qualifications

Forty-four participants have some qualification and could therefore be regarded as professionals in their field. The representation of different qualification levels together with years of experience is purposive, as complexity and adherence to SCM requirements under conditions of complexity require more sophisticated skills than, for example, would be required in a simple organisation with highly routine functioning.

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5.3 INSIGHT INTO COMPLEXITY

In this category, statements are made about complexity within local government in order to participants to indicate whether local government is a complex organisation as defined by complexity theory. Various statements are dealt with in this section, as shown in Table 5.1.

Table 5.1: Insight into complexity – Category A, Part 2 analysis

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
VUCA (volatility, uncertainty, complexity and ambiguity) describes the world today.	1	2	4	13	3
A VUCA environment requires more nuanced thinking.	1	0	5	14	3
Local government is operating near a threshold of instability.	1	2	2	12	4
Conditions in local government are constantly changing.	1	2	1	13	6
For local government to remain relevant, it must adopt survival, evolutionary and developmental approaches and should review its mandate and processes continuously.	1	0	2	17	3

5.3.1 Insight into Complexity – Category A, Part 2, Statement 3 Analysis

Statement 3 attempts to establish the level of instability within local government, as instability in an organisation to some extent enables the establishment of whether or not such an organisation is complex. Sixteen respondents agree that local government is operating near a threshold of instability. The responses above align local government and municipalities within the description of VUCA (volatility, uncertainty, complexity and ambiguity) and indicate that

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to some degree municipalities are thus complex organisations. Results are reflected in Figure 5.4 below.

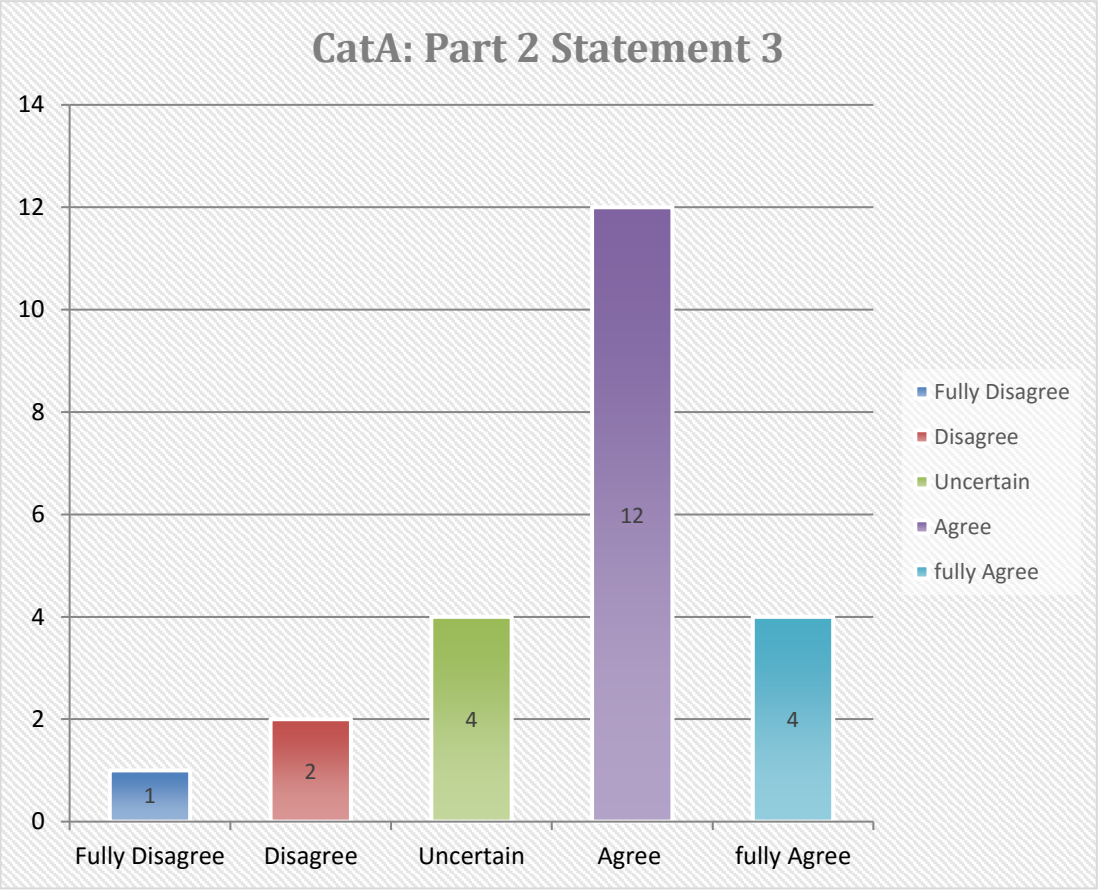

Figure 5.4: Insight into complexity – Category A, Part 2, Statement 3 analysis

5.3.2 Insight into Complexity – Category A, Part 2, Statement 4 Analysis

Respondents were required to indicate their opinion in terms of whether local government operates within a constantly changing environment. In this regard, nineteen respondents agree that conditions in local government are changing constantly, as shown in Figure 5.5 below.

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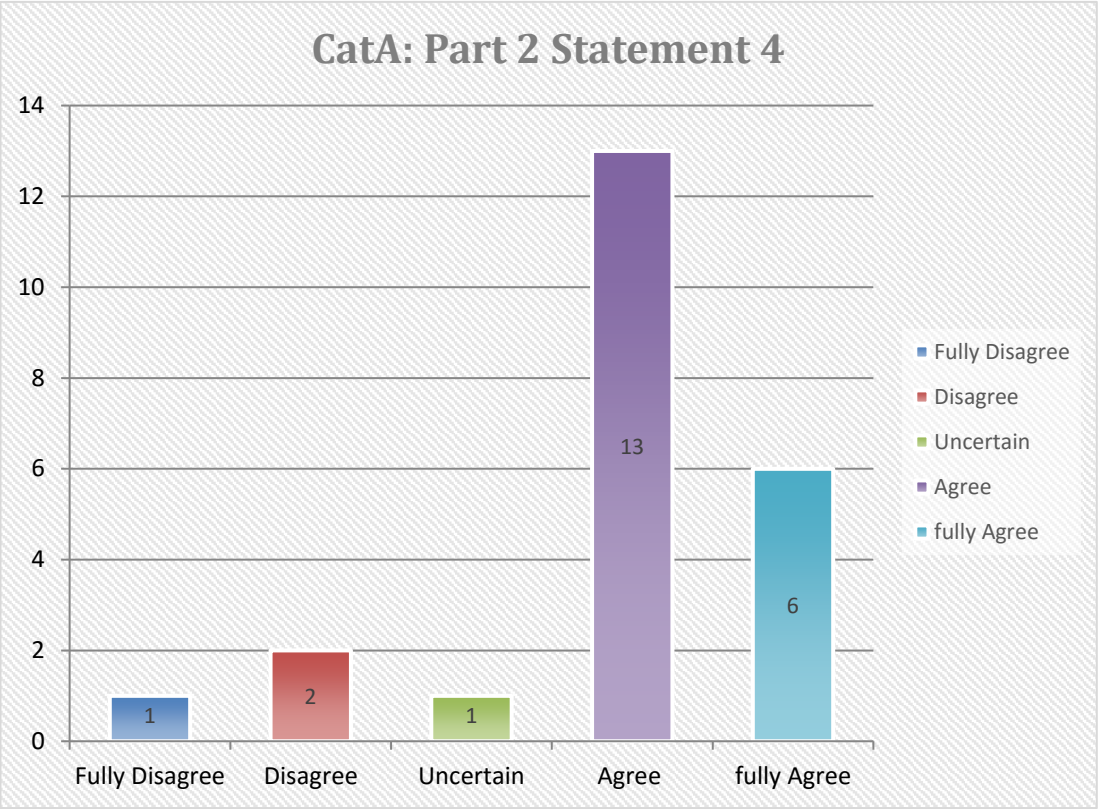

Figure 5.5: Insight into complexity – Category A, Part 2, Statement 4 analysis

5.3.3 Insight Into Complexity – Category A, Part 2, Statement 5 Analysis

In this statement, emphasis is placed on actions required from local government to remain relevant. Nineteen respondents agree that for local government to remain relevant it should adopt survival, evolutionary and developmental approaches and should continuously review its mandate and processes. The results are reflected in Figure 5.6 below.

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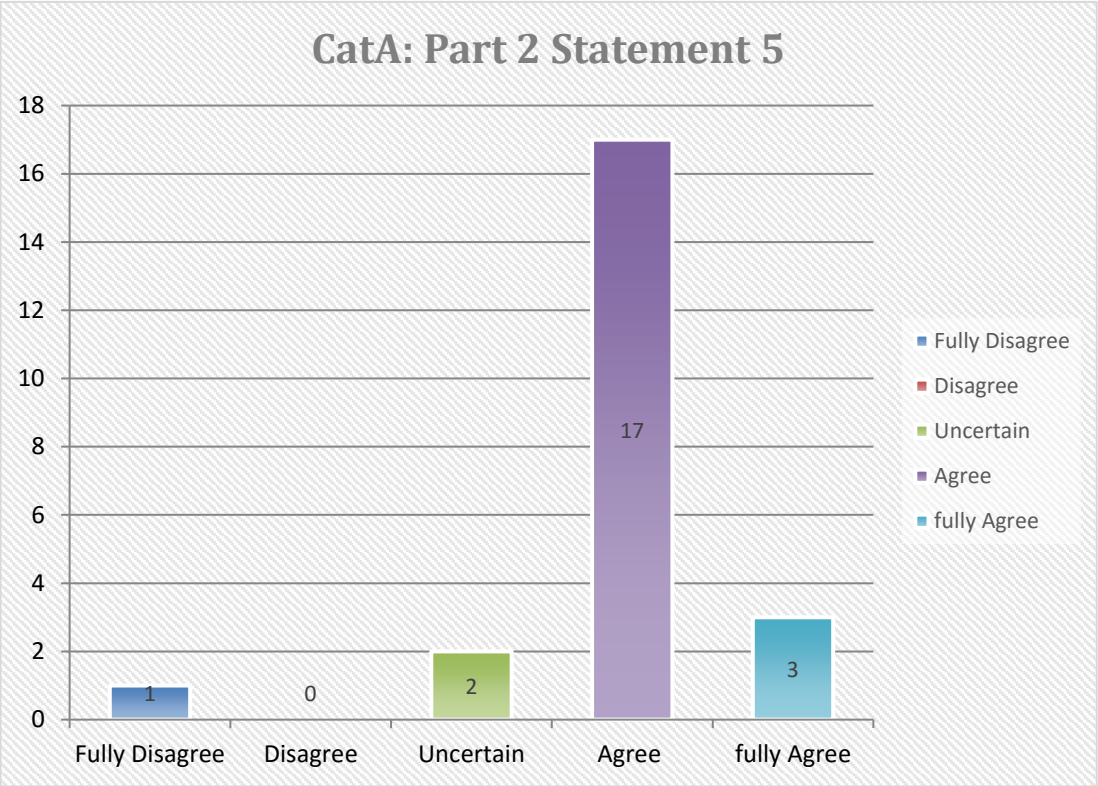

Figure 5.6: Insight into complexity – Category A, Part 2, Statement 5 analysis

5.3.4 Conclusion: Insight into Complexity – Category A, Part 2

In any organisation, uncertainty is a serious challenge that an organisation must take reasonable steps to address. The sixteen respondents (senior management and SCM officials) in this category agree that volatility, uncertainty, complexity and ambiguity describe local government and that local government operates near a threshold of instability. Twenty respondents indicate these factors, together with constant changes to legislation, are a serious challenge for local government and a need exists for the review of local government mandates and processes. The fact that local government mandates and legislations are continuously indicated as important factors for consideration has implications for the structural reorganisation of local government and its associated processes.

These findings should be seen from the perspective that if an organisation experiences complexity, this will affect the behaviour of that organisation. Therefore, local government

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being confirmed as a complex organisation implies that these complexities will influence its behaviour and it will be required to respond to these complexities. The current overarching legislative framework does not make provision for such flexibility. The results are indicated in Table 5.2 below.

Table 5.2: Insight into complexity – Category D analysis

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
Local government exhibits a complex character and system.	5	5	17	34	15

Forty-nine respondents agree that local government exhibits a complex character and systems, while ten disagree with the statement. Seventeen respondents remain uncertain. These twenty-seven respondents are an important indicator but are not significant enough number compared with the forty-nine respondents with a different opinion (agree and fully agree). The seventeen respondent who are uncertain of their position regarding the statement could have been responded from a lack of understanding of local government or complexity.

5.3.5 Insight into complexity – Category C, Statement 2 Analysis: Viability of Supply Chain Management in Complex Local Government Organisations

Table 5.3: Insight into complexity – Category C, Statement 2 analysis

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
Complexity in the organisation influences its behaviour.	0	2	0	5	2

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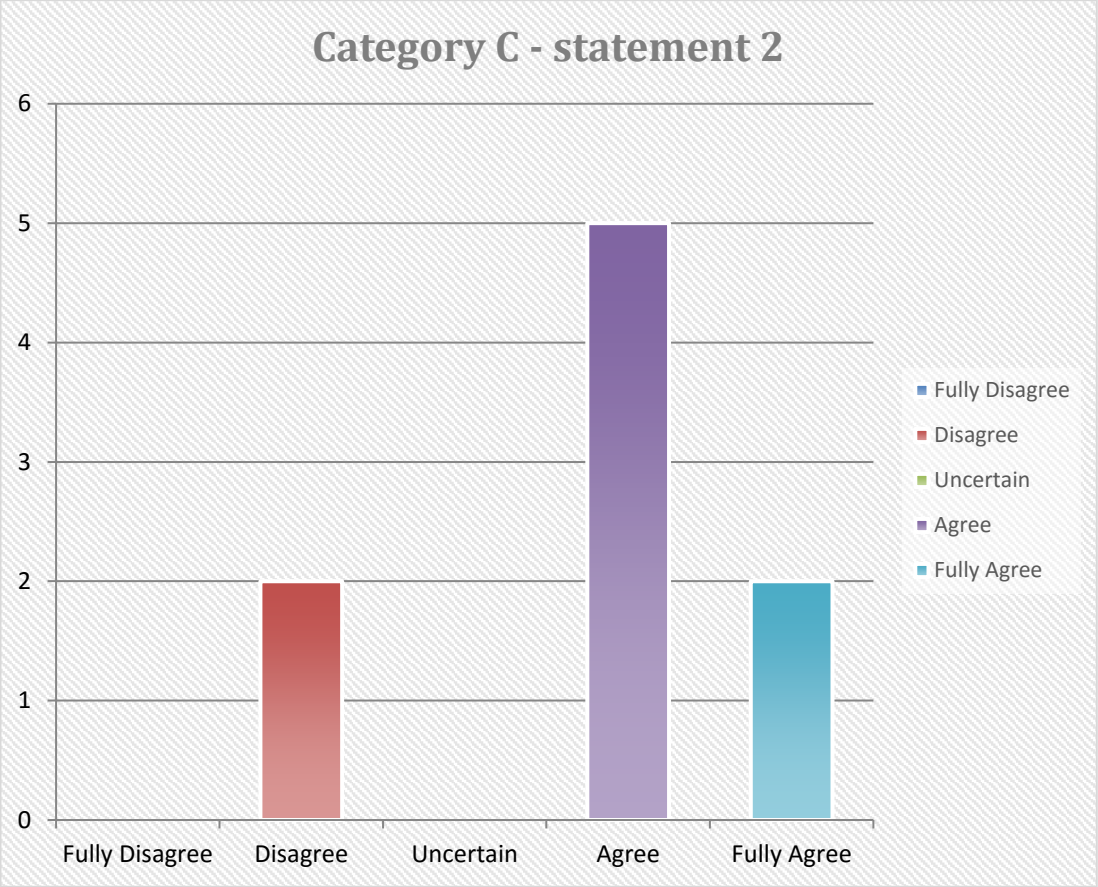

Figure 5.7: Insight into complexity – Category C, Statement 2 analysis

Nine councillors participated in this category. In respect of whether complexity in the organisation influences its behaviour, the majority of respondents agree with the statement. This question is important as it confirms that the behaviour of the organisation is dependent on its complexity and thus its complexity dictates how it will respond to its challenges.

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5.3.6 Insight into Complexity – Category D, Statement 1 Analysis

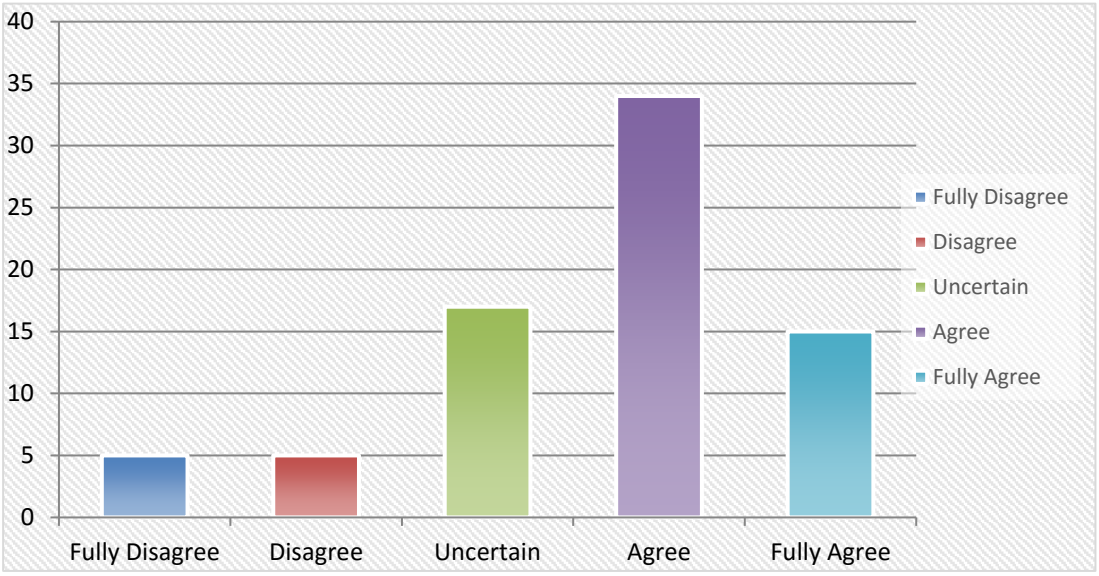

Figure 5.8: Insight into complexity – Category D, Statement 1 analysis

This question seeks to establish whether or not municipalities exhibit a complex character and systems, which directly answers the question of whether or not municipalities in South African can be regarded as complex organisations. If characterised as complex, municipalities should consider complexity theory as an approach.

Table 5.4: Insight into complexity – Category D, Statement 1 analysis

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
Local government exhibits complex character and systems.	5	5	17	34	15

Forty-nine respondents agree with the statement that local government possesses a complex character and systems. Benbya and McKelvey (2016:16) claim that complexity theory is a new way of thinking about the systems of interacting agents such as organisations or firms and differs from mechanical theories that assume a particular centrally controlled governing

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structure. As municipalities are complex organisations, they must adapt to new approaches and move away from the traditional way of doing things.

Table 5.5: Insights into complexity – Category F, Part 2 analysis

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
VUCA (volatility, uncertainty, complexity and ambiguity) describes the world today.					1
The VUCA environment requires more nuanced thinking.					1
Local government operates near a threshold of instability.					1
Flexibility is required to respond to the uncertainty effect.				1	
Local government is near entropy of equilibrium.					1
Complexity is identified through the relationships among systems rather than their constituent parts.					1
In order for an organisation to understand its own complexity, it must understand its own functioning.					1

Part 2 of Category F aims to establish whether local government is indeed a complex organisation. When asked the same the same questions that were posed to senior management, the representative from the Office of the Auditor-General is convinced that local government is in fact a complex organisation.

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SCM remains a complicated phenomenon for local government, and its effectiveness in responding to service delivery challenges remains a vision. Since local government experiences a high level of skills shortage, a lack of a comprehensive understanding of SCM, effects from the external environment and internal complexities, SCM is not a success in local government. The main source of problems remains the complexity of local government that results in the non-viability of SCM. The respondents identify that the complex character of local government should be factored into SCM legislation in order to ensure SCM viability, as well as success in local government.

5.4 INSIGHT INTO SUPPLY CHAIN MANAGEMENT THEORY AND PRACTICE

Category A, Part 1 deals with insight into supply chain management theory and practice and was completed by senior and middle managers.

Table 5.6: Insight into supply chain management theory and practice, Category A, Part 1

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
As part of the management of JB Marks Local Municipality, I have a comprehensive understanding of the supply chain and SCM.	2	1	2	13	4
The supply chain comprises a network of organisations that are involved upstream and downstream of resource usage.	1	3	3	11	5
The supply chain and SCM approach is a private sector approach.	3	8	6	4	2
Currently, the public sector supply chain and SCM are in the developmental phase.	2	3	3	12	3

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Currently, the public sector supply chain and SCM are in the maturity phase.	2	11	2	7	22
Current local government procurement procedures seek to achieve the best possible results at the best possible cost with the best possible quantity and quality in order to achieve the objectives as set out in the Constitution.	1	4	2	11	5
Currently, public sector organisations handle the procurement of goods and services within a network of organisations through upstream and downstream linkages with various processes and activities that produce goods and services.	2	5	1	12	2
Currently, the supply chain and SCM are relevant and create value.	1	5	1	12	4
Factors external to local government are impacting on the optimal functioning of SCM.	1	3	6	6	7
SCM requires a high level of commitment, skills, capacity and understanding of the supply chain objective.	1	1	0	4	17
SCM requires constant adjustment to its founding legislative framework to ensure that it addresses all unanticipated changes.	1	0	0	6	16

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5.4.1 Insight into Supply Chain Management Theory and Practice: Supply Chain Management Functioning in Local Government

The purpose of the questions in this section of the questionnaire is to determine a correlation or nexus between SCM literature and the current practice of local government SCM and its efficiency, and whether current legislation is sufficiently addressing all challenges.

Part 1 of Category A aims to obtain a global picture of the current status of SCM and, based on the respondents' choices, to make recommendations on how such situations can be rectified. The respondents are all senior and middle managers, including SCM officials, who are faced with SCM business processes and decision making on a daily basis. All questions are important; however, only a few will be looked at below.

5.4.2 Insight into Supply Chain Management Theory and Practice – Category A, Part 1, Statement 1

The main aim of the statement is to establish whether senior managers, middle managers and SCM officials have a thorough understanding of the supply chain and SCM. This question is an important preliminary question that lays a solid foundation for the research.

The expectation is that senior management, middle management and SCM officials possess a comprehensive understanding of SCM, and indeed 17 respondents agree that they are well acquainted with the concepts of supply chain and SCM. It is worrying that three respondents indicate they are not quite certain of their understanding of the concepts and two are uncertain whether they had a comprehensive understanding of the supply chain and SCM, as reflected in Figure 5.6. This could indicate capacity deficiency within senior and middle management and the SCM units, which could have serious repercussions for the total functioning of SCM within the local municipality.

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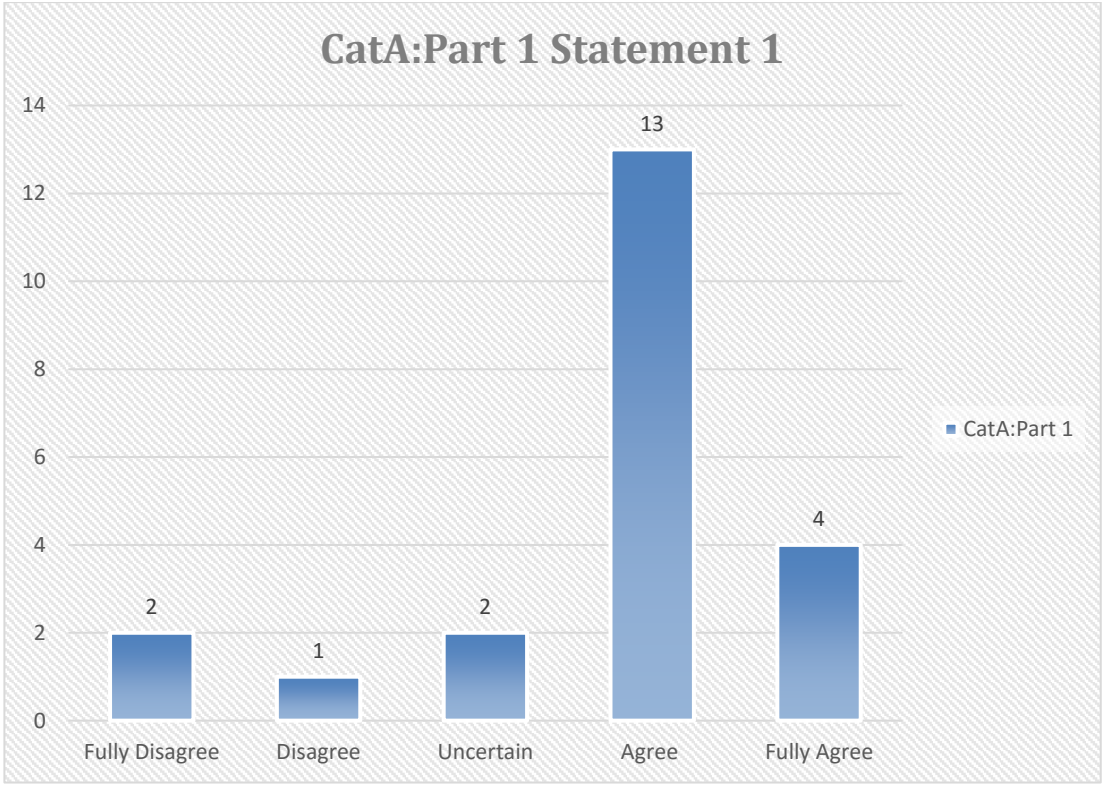

Figure 5.9: Insight into SCM theory and practice – Category A, Part 1, Statement 1 analysis

5.4.3 Insight into Supply Chain Management Theory and Practice – Category A, Part 1, Statement 3 Analysis

This statement tests respondents' knowledge about SCM literature. This could be easily linked to the first statement while the results indicate quite a different and contrasting outcome.

In respect of the roots of SCM, the majority of respondents disagree with the notion that SCM has its roots in the private sector, as reflected in Figure 5.10 below. The respondents' belief that SCM has its roots in private sector organisations is mainly informed by two aspects: the fact that private sector organisations with all their challenges and complexities can successfully manage SCM systems and processes to the benefit of the organisation and that, due to their education level, some respondents have a clear understanding that SCM existed in the private sector long before its introduction into the public sector, thus their conclusion that SCM has its roots in the private sector.

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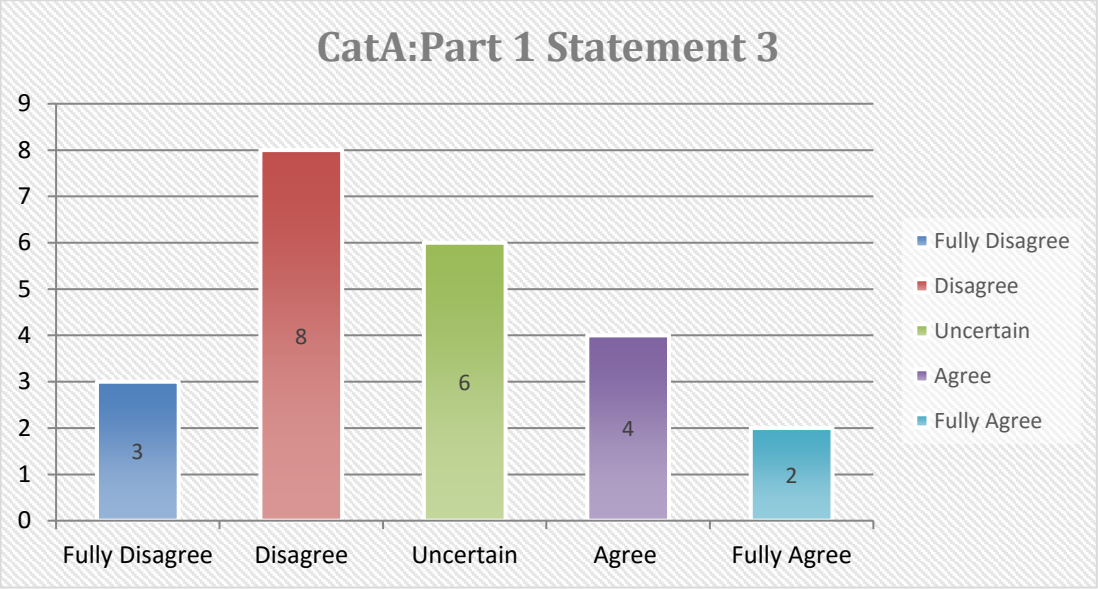

Figure 5.10: Insight into SCM theory and practice – Category A, Part 1, Statement 3 analysis

5.4.4 Insight into Supply Chain Management Theory and Practice – Category A, Part 1, Statement 4 Analysis

Regarding the SCM developmental phase, most respondents (15) agree that SCM is in the developmental stage within local government. This statement is directly linked to Statement 5 in the same category where the respondents disagree with the statement that SCM is in the maturity phase.

5.4.5 Insight into Supply Chain Management Theory and Practice – Category A, Part 1, Statement 9 Analysis

The statement looks at whether or not factors external to local government impact on the functioning of SCM. Thirteen respondents agree that external factors impact on the optimal functioning of SCM. It is evident that the external environment exerts extreme pressure on the functioning of SCM and is therefore impacting on the optimal functioning thereof. The results for this statement are reflected in Figure 5.11 below.

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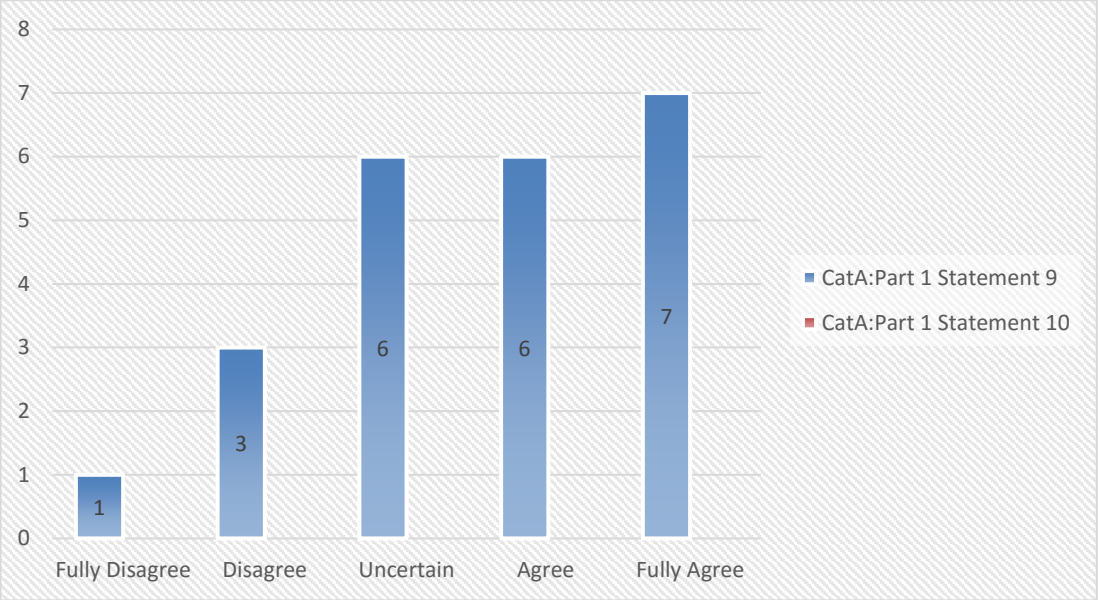

Figure 5.11: Insight into SCM theory and practice – Category A, Part 1, Statement 9 analysis

5.4.6 Insight into Supply Chain Management Theory and Practice – Category A, Part 1, Statement 11 Analysis

Statement 11 solicits input from respondents on the effectiveness of the current SCM legislative framework and on whether or not the framework requires constant amendment to ensure all unanticipated challenges are addressed. A majority of respondents (22) agree that a need exists for constant amendment of the framework to address any unexpected challenges, which connects with Statement 4 in which the majority of respondents agree that SCM is in the developmental phase. Figure 5.12 indicates the results.

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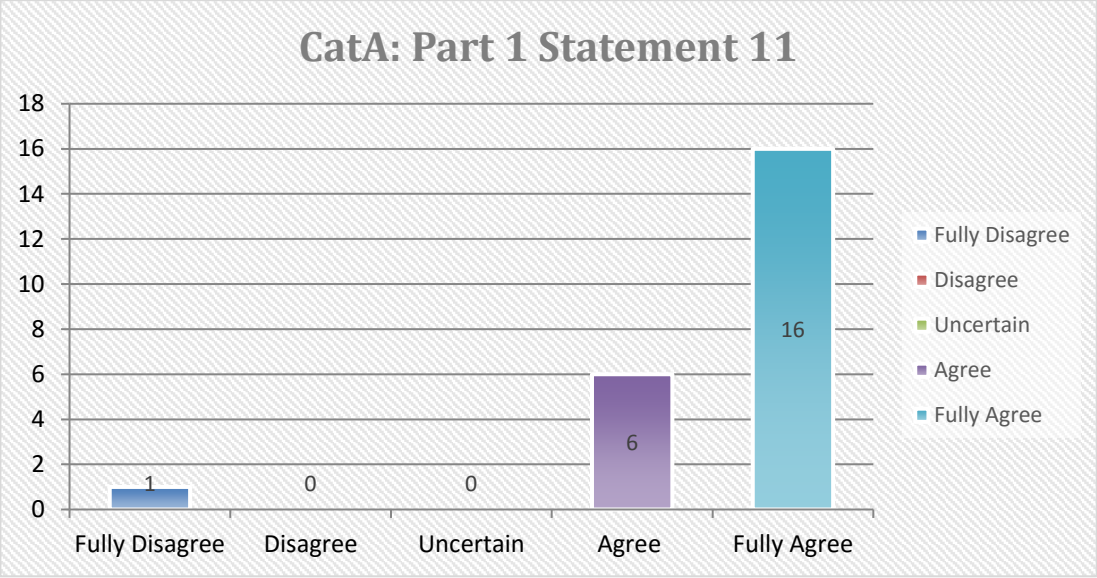

Figure 5.12: Insight into SCM theory and practice – Category A, Part 1, Statement 11 analysis

Category B deals with the insights of middle managers into SCM theory and practice.

Table 5.7: Insight into SCM theory and practice – Category B, statements 1-6 analysis

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
An SCM emphasis is a solution to the current public sector challenges.	1	1	2	10	4
SCM adds value to public sector organisations.	1	1	3	11	2
SCM reduces cost, facilitates information sharing and eliminates duplication.	1	3	3	11	2
Understanding of SCM is linked to compliance with a legislative framework only.	1	1	3	9	2
Understanding of SCM is linked to the legislative framework and related literature explaining the	1	1	11	4	17

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intentions, processes and techniques.					
The current public sector SCM protocol causes certainty and efficiency, given the integration of actions of various stakeholders, for example suppliers, regulators, SCM staff and users of resources.	1	1	3	11	2

5.4.7 Insight into Supply Chain Management Theory and Practice – Category B, Statements 1-6 Analysis

With these statements the overall aim is to assess the importance, relevance, contribution and comprehension of SCM amongst the operational and supervisory level employees of JB Marks Municipality. Eighteen respondents completed the category, and it is clear that this level of employees has a clear understanding of the nature and purpose of SCM. This group of employees is involved with SCM as direct or indirect activity within their functions on a daily basis. The figures below show the results for the various statements, all indicating a clear understanding of SCM.

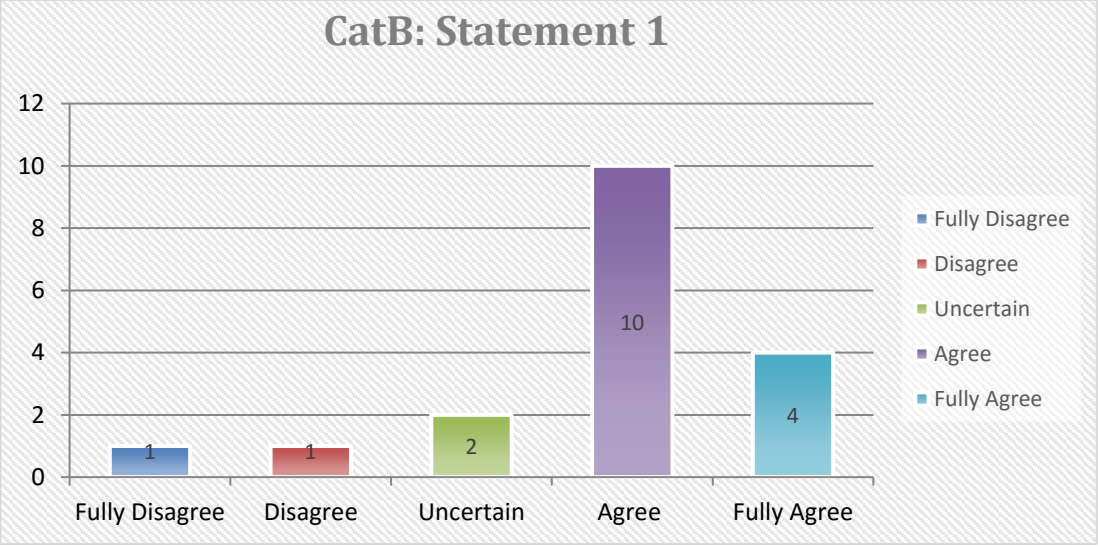

Figure 5.13: Insight into supply chain management theory and practice – Category B, Statement 1 analysis

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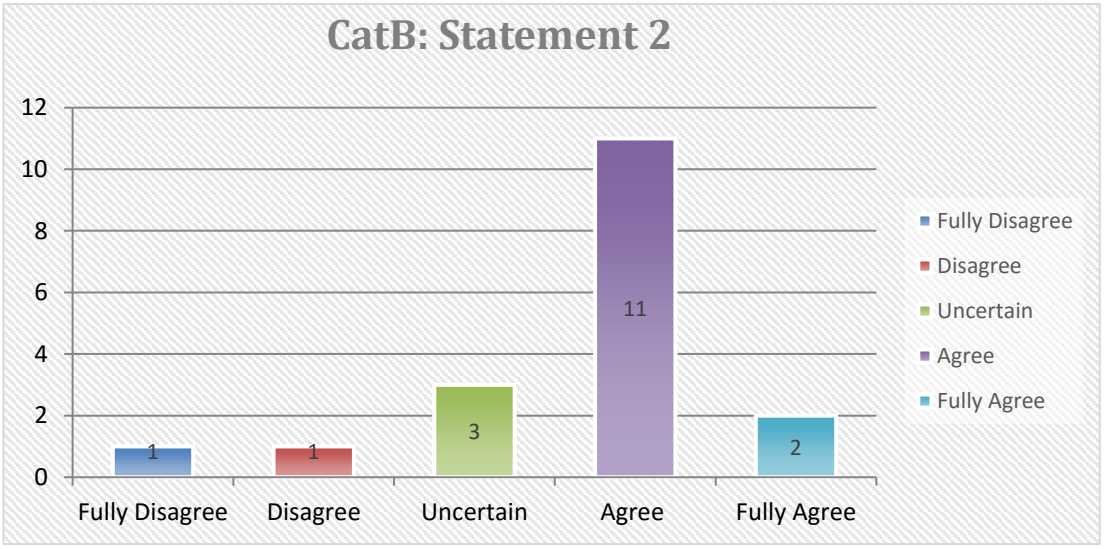

Figure 5.14: Insight into supply chain management theory and practice – Category B, Statement 2 analysis

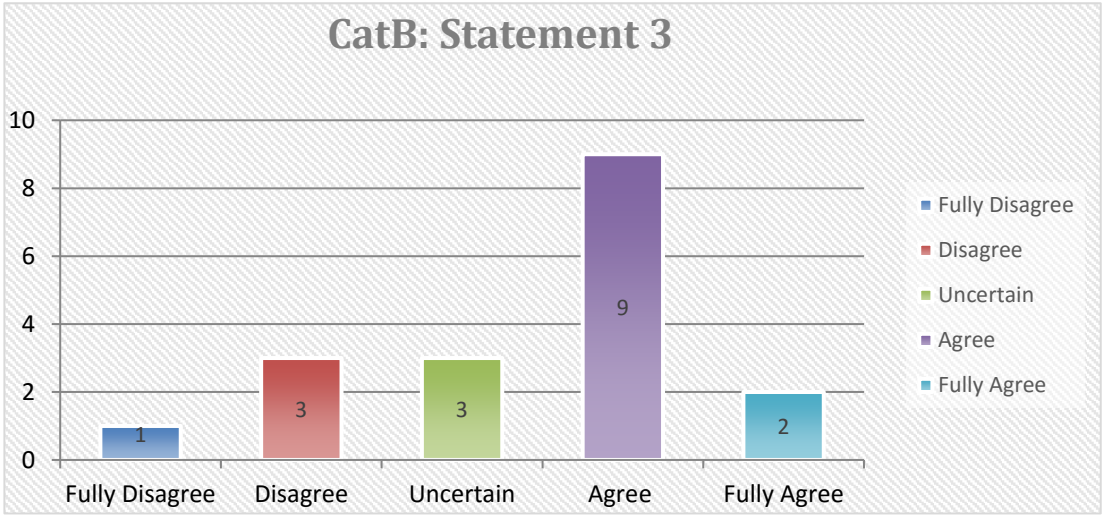

Figure 5.15: Insight into supply chain management theory and practice – Category B, Statement 3 analysis

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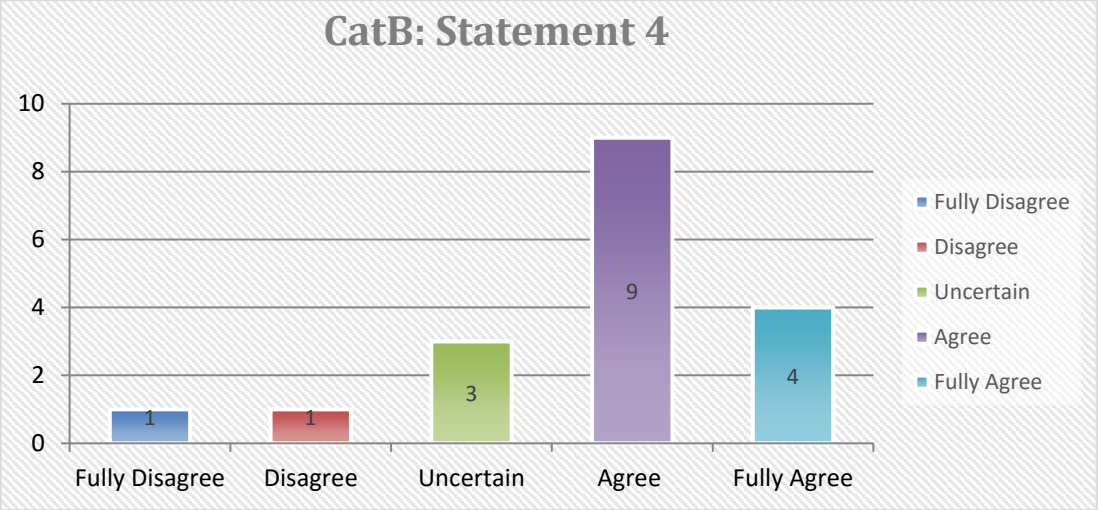

Figure 5.16: Insight into supply chain management theory and practice – Category B, Statement 4 analysis

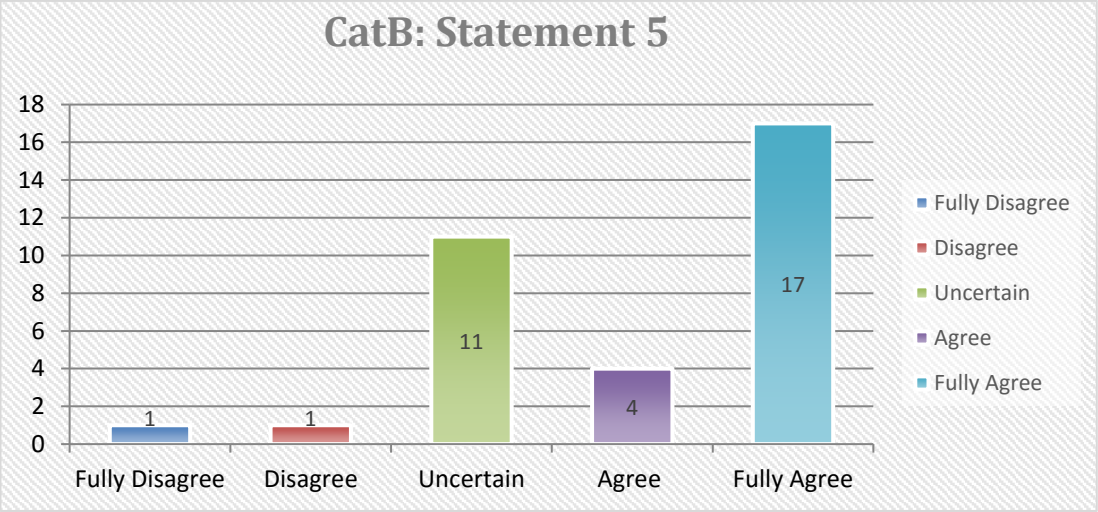

Figure 5.17: Insight into supply chain management theory and practice – Category B, Statement 5 analysis

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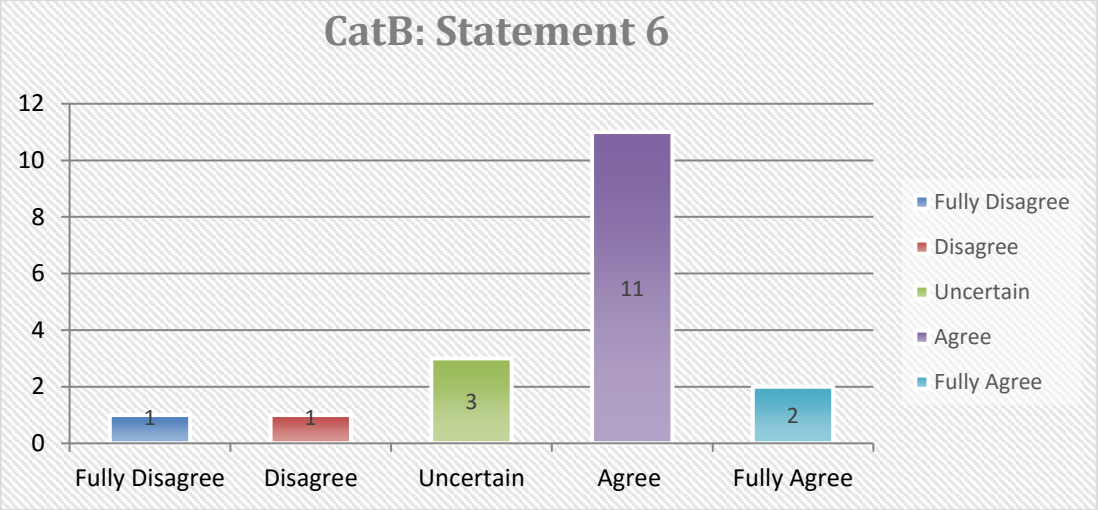

Figure 5.18: Insight into supply chain management theory and practice – Category B, Statement 6 analysis

5.4.8 Conclusion: Insight into Supply Chain Management Theory and Practice – Category A Part A

The findings of this section of the research can be summarised by indicating that the results show that while the majority of senior management and SCM officials within the municipality have a comprehensive understanding of SCM and its processes, a grey area still exists within the management structure about management having a holistic, comprehensive and integrated knowledge and understanding of SCM. This has a definite effect on the functioning of SCM, including decisions taken at management level that have a direct and indirect effect on SCM. Tukamuhabwa, Stevenson, Busby, and Zorzini, (2015:5593) claim that the majority of SCM problems derive from the external environment, while some problems and challenges come from within the organisation.

After 13 years of local government SCM, senior management and SCM officials agree that SCM remains at the developmental phase, far from maturity. This is influenced by SCM's demands for a high level of commitment, skills, capacity and understanding in order to achieve its objectives, which, according to the National Treasury Review of SCM (RSA, 2015:1), local government does not possess. Generally, there is a lack of understanding of SCM, with its strategic importance not being recognised nor adequately capacitated.

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From a legislative perspective, 22 of the 23 respondents who participated in this category indicate that SCM requires constant adjustment to its founding legislative framework to address all unanticipated changes. This finding has serious implications for the structural setup of SCM within municipalities since some changes to the founding legislation could require a total overhaul of local government SCM.

Regarding this category, the study reveals that SCM in local government is about compliance with the legislative framework, addressing the national government's vision of ensuring that the local sphere of government becomes compliant with its regulatory environment. This compliance objective undermines the fact that SCM's objective is to ensure efficiency and effectivity. In this regard, SCM is not about compliance but about ensuring an efficient system. National government regards the successful implementation of SCM firstly as a compliance requirement with the rest following the latter. This finding is important to an understanding of the legislative framework since it hampers the overall objective of SCM.

5.5 INSIGHT INTO THE APPROPRIATENESS OF THE SUPPLY CHAIN MANAGEMENT LEGISLATIVE FRAMEWORK

This part of the questionnaire directly evaluates the SCM legislative framework and, based on the responses, concrete recommendations can be made in respect of this all-important directive for SCM.

Table 5.8: Insight into the appropriateness of the supply chain management legislative framework statement responses

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
Current public legislation is sufficient for the implementation of SCM.	2	6	4	7	4
A need for changes to the current legislative framework exists.	0	2	3	16	1
The National Treasury's constant changes to legislation indicate a	0	3	3	13	4

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crisis in the implementation of SCM.					
A legislative framework reflective of local government complexities will enhance the implementation of SCM.	0	1	1	19	2
An SCM legislative framework is understood to consist of two broad focus areas, namely the establishment of a framework for governance principles in the procurement of goods and services and the introduction of the preferential system aiming at addressing socioeconomic objectives.	1	0	2	17	3

5.5.1 Insight into the Appropriateness of the Supply Chain Management Legislative Framework – Category A, Part 3, Statements 1-3 Analysis

An assessment of the current legislative framework is made through these statements (1-3), with additional statements aiming to recommend what more can be done to respondents. With Statement 1 an attempt was made to solicit the views of respondents in respect of whether or not current legislation is sufficient for the implementation of SCM. Respondents agree that current legislation is sufficient. For Statement 2, respondents indicate a need for changes to existing legislation. For Statement 3, the opinion of respondents is that the National Treasury's constant changes to legislation indicate a crisis in the implementation of SCM. The figures below indicate the outcomes.

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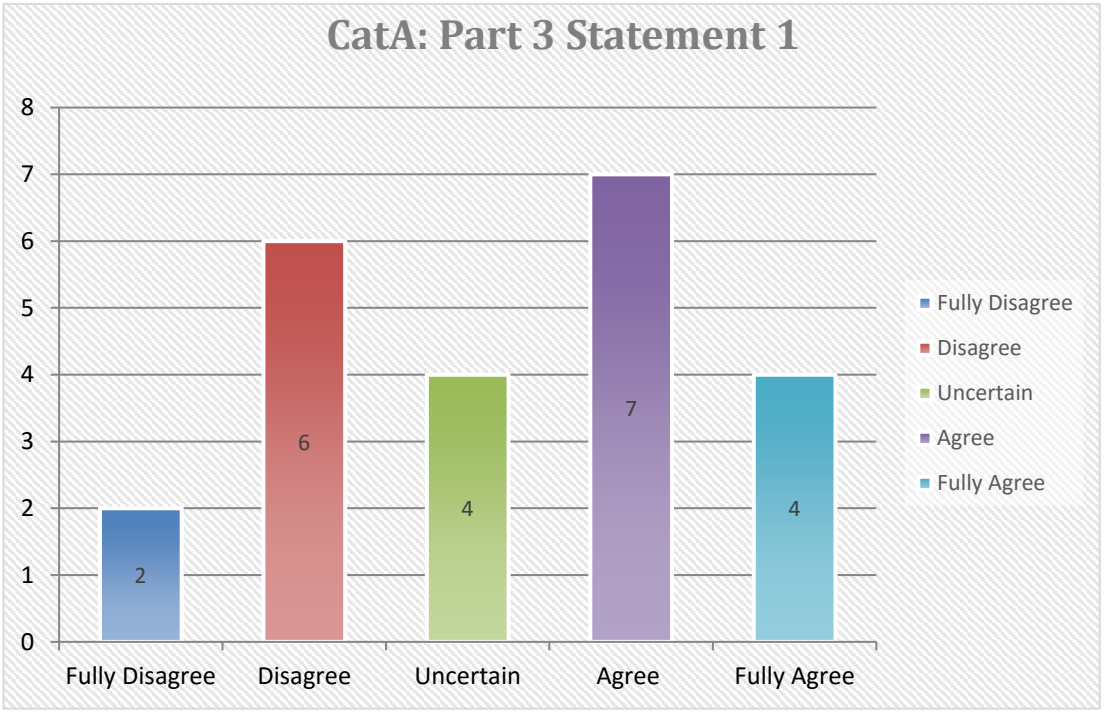

Figure 5.19: Insight into the appropriateness of the supply chain management legislative framework – Category A, Part 3, Statement 1 analysis

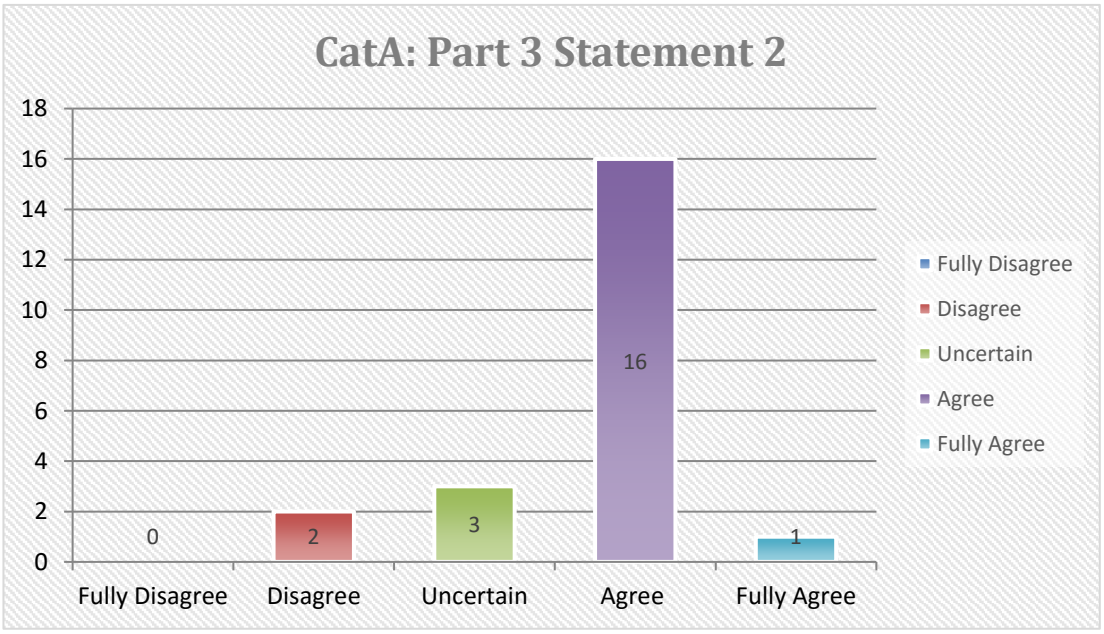

Figure 5.20: Insight into the appropriateness of the supply chain management legislative framework – Category A, Part 3, Statement 2 analysis

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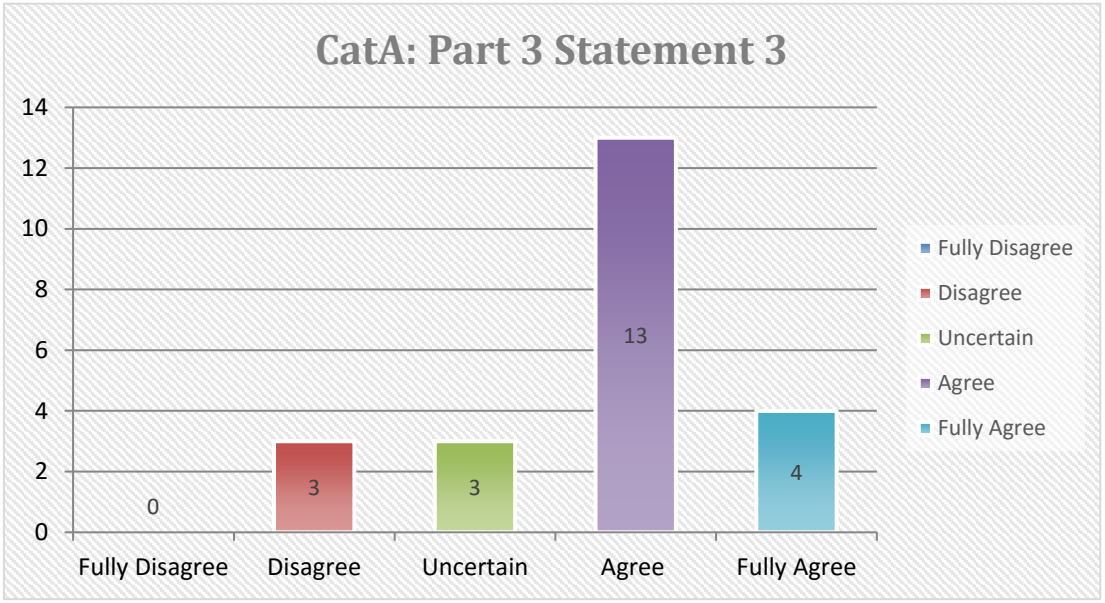

Figure 5.21: Insight into the appropriateness of the supply chain management legislative framework – Category A, Part 3, Statement 3 analysis

5.5.2 Conclusion: Insight into the Appropriateness of the Supply Chain Management Legislative Framework – Category A, Part 3

Seventeen respondents indicate a need to change the current legislation to make provision for complexity in local government. While eleven respondents agree that current legislation is sufficient, eight disagree and state that significant consideration is required to take into account these findings. Four respondents are unsure if the legislative framework is sufficient. Important to note is that twenty-two respondents indicate that new legislation factoring in the complexity in local government is required to enhance SCM. Proposed legislation will therefore take note of current challenges and ensure that they are addressed. These changes could contribute to the developmental phase of SCM in local government. Constant amendments to the SCM legislative framework indicate a crisis, with national government struggling to deliver a one-size-fits-all legislation and the fruits of the review of local government SCM still to be seen.

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5.6 INSIGHT INTO SUPPLY CHAIN MANAGEMENT IN A COMPLEX ORGANISATION

Table 5.9: Insight into supply chain management in a complex organisation – Category F, Part 2 analysis

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
VUCA (volatility, uncertainty, complexity and ambiguity) describes the world today.					1
The VUCA environment requires more nuanced thinking.					1
Local government operates near a threshold of instability.					1
Flexibility is required to respond to the uncertainty effect.				1	
Local government is near entropy of equilibrium.					1
Complexity is identified through the relationships among systems rather than their constituent parts.					1
In order for an organisation to understand its own complexity, it must understand its own functioning.					1

5.6.1 Insight into Supply Chain Management in a Complex Organisation – Category F, Part 2 Analysis

Part 2 of Category F aims to establish whether or not local government is a complex organisation. Through its representative, the Office of the Auditor-General responded positively. In respect of the same questions posed to senior management, the representative is convinced that local government as an organisation is complex.

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SCM remains a complicated phenomenon in local government, and its effectivity is far from clear as it remains a vision. Since local government experiences a high level of skills shortage, a lack of a comprehensive understanding of SCM, external environmental effects on SCM and internal complexities, SCM is not a success in local government. The main source of challenges and problems remains the complexity of local government that results in the non-viability of SCM in local government. Respondents identify that the complex character of local government must be factored into SCM legislation in order to ensure SCM viability and success in local government.

5.7 CONCLUSION

Local government remains the sphere of government closest to the community. It has a massive responsibility for the delivery of municipal services and the community expects it to have the knowledge and know-how to respond to questions and unclarities relating to provincial and national government functions. In addition, it is to some extent responsible for other matters of national interest.

Local government remains the most important sphere of government through which national and provincial spheres of government deliver messages to the community, including some national basic services. Local government must therefore have the necessary legislative framework, internal systems and capability to deliver on its mandate, including the expectations of the overall government hierarchy. Municipalities, as a system with subsystems that operate with a specific aim and objective, find themselves unable to deliver the most basic services and meet specific minimum requirements relating to their regulatory requirements. Municipalities find themselves in a defective position with systems and subsystems that are dependent on each other and interrelated and are not functioning optimally and progressively within a systematic environment. This phenomenon is not natural within the local government environment, and its roots and influences must be traced for a solution.

Local government remains a special organisation with a unique character and operations; thus, the research posed the question whether local government resembles a complex organisation as defined by complexity theory. The empirical research reveals the following results.

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Respondents, including senior and middle management, operational or supervisory level employees, SCM staff, councillors, community members and a representative from the Office of the Auditor-General unanimously agree that local government exhibits a complex character and systems. The results are informed by the fact that local government is constantly changing and municipalities are operating near a threshold of instability. The local government environment is described by the VUCA scenario, which asserts that the world today is characterised by volatility, uncertainty, complexity and ambiguity. The respondents agree that this scenario represents local government.

As revealed by the respondents, local government is a complex organisation, and complexities within the organisation influence its behaviour. For local government to remain relevant it must adopt survival, evolutionary and developmental approaches, and review systems and processes. Government procurement, as framed through the SCM approach, is an important contributing factor to the gross domestic product and is therefore an important function within government.

The research reveals that SCM is about the flow of goods and services from raw to finished, with interaction amongst different role players who influence the final product, making single-point accountability impossible. The supply of goods and services through a chain must be assessed as a single process. For the SCM approach to survive the complexities of local government, it must exhibit creative, innovative behaviours within its total system to address the complexity experienced by local government.

The research findings indicate that SCM forms a critical subsystem within the total systematic functioning of the municipality. Fifty percent of senior and middle management indicate that within local government there is a general and comprehensive understanding of the purpose, aim and objective of local government. Forty-five percent of senior management agree that the SCM approach creates value, while forty-five percent disagree. This finding is peculiar for such an important local government function.

The above findings could be informed by the fact that 50% of respondents agree that the SCM approach is not yet in the maturity stage, but rather remains in the developmental stage. One important finding is that SCM is not primarily a private sector approach and could be applied within the public sector. SCM could therefore be a solution to public sector procurement. Important to address current challenges, 57% of respondents agree that SCM requires constant

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changes to its founding legislative framework to address the complexity challenges faced by local government. Core to public sector SCM is proper management of procurement/SCM to eradicate all service delivery failures in local government. Thus, improvement of the local government procurement system will enhance service delivery to beneficiaries.

In response to the research question of whether or not local government is a complex organisation, from a general approach and from a legislative perspective it was proven that local government exhibits a complex character. The second aspect addresses whether SCM can work in a complex organisation. In this regard, since SCM is founded on legislation, the response to this question is that the legislative framework must be reflective of local government complexity, which will help SCM to reach maturity stage. Therefore, SCM can only work effectively and efficiently if complexity in the organisation is addressed in its legislative framework.

Lastly, how complexity in organisations affects the functioning of SCM was addressed. In this regard, the research indicates that the complexity within an organisation influences its functioning. Therefore, a need exists for this complexity to be addressed in order to improve government procurement and to ultimately enhance the delivery of services within local government and government in general.

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CHAPTER 6: CONCLUSION, RECOMMENDATIONS AND STUDY LIMITATIONS

6.1 INTRODUCTION

The theoretical and legislative framework discussed in chapters 2 and 3 of the study lay the foundation for the implementation of SCM within the public sector in South Africa. This final chapter of the thesis provides a summary of the preceding chapters. The primary findings and deductions derived from the literature review and empirical study are also provided and a conclusion on the study is drawn. It is important to note that the questionnaire did not attempt to measure a correlation between related variables, but was aimed at determining to what extent and why stakeholders think that the particular organisation is a complex one and to thus confirm the features of a complex organisation are present.

6.2 SUMMARY OF THE CHAPTERS

Chapter 1 provides an introduction and background to the study. The chapter explains the rationale for and the significance of the study. An overview of SCM within the public sector in South Africa is provided. The research problem is presented and motivated, and the research methodology followed in the study is outlined. Based on the current SCM framework and the nature of the operations of local municipalities in South Africa, an assertion is made that local government is a complex organisation.

Chapter 2 provides a theoretical framework for SCM and presents complexity theory. The chapter focuses on defining SCM, its purpose, importance and origin. The linkage between SCM as a concept and a process is also established.

An overview of complexity theory is provided, and a picture of complexity theory and organisations is presented. In addition, in respect of complexity theory, the characteristics and behavioural patterns of a complex organisation are provided. A detailed picture is created relating to the use of complexity theory in evaluating and analysing organisations.

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Chapter 3 provides the legislative framework pertaining to the public sector supply chain in South Africa. The Constitution of the Republic of South Africa is used as the starting point and cornerstone of SCM legislation. It is indicated that the statutory and regulatory framework pertaining to SCM has been developed with the founding legislative prescripts as a basis and guidelines for current practices emanating from private sector organisations.

Chapter 4 gives an overview of the case study, providing details regarding JB Marks Local Municipality and the nature of its operations. This overview intends to ensure a clear picture of the municipality. The merger of Ventersdorp Municipality and Tlokwe City Council to form JB Marks Municipality is discussed. The current standing of the municipality in respect of audit outcomes and related ratings is also provided.

Chapter 5 provides an assessment through empirical research of the theoretical and legislative framework presented in chapters 2 and 3. The results obtained by means of a self-administered questionnaire used as data-collection method are revealed and interpreted. The main aim of the empirical investigation is to determine whether shortcomings identified through the research problem are really present in JB Marks Local Municipality with a view to make recommendations on how the situation could be improved.

The findings of the study reveal that local government today operates near a threshold of instability and within constantly changing conditions. Therefore, local government with all its instability and the effects of the external environment exhibits the character of a complex organisation. Senior and middle management and SCM officials indicate that for local government to remain relevant it should adopt survival, evolutionary and developmental approaches and should review its mandate and processes continuously. Municipal councillors believe that complexity in the organisation influences its behaviour, a confirmation that the more complex an organisation, the more complex its behaviour.

The findings indicate that SCM is in the developmental phase within South African local government. Senior and middle management and SCM officials in particular indicate that factors external to local government impact on the optimal functioning of SCM. The findings also reveal that, while SCM requires a high level of commitment, skills, capacity and understanding of supply chain objectives, it also requires constant adjustment to its founding legislative framework to ensure it addresses all unanticipated changes.

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The study reveals that local government in South Africa exhibits a complex character and systems, thereby confirming the research question of whether or not local government is a complex organisation. Local government is faced with challenges of conflicting interests, confusing information, massive clientele and decision makers being unable to keep abreast of their responsibility of making decisions timeously due to inconsistent values. These challenges have ramifications for the system of which are incompatible. Quite a considerable mismatch exists within municipalities. Local government is a complex system, requiring skills and understanding from all stakeholders. Efforts by national government to ensure uncertainty is managed lack speed, with amendment after amendment being implemented. SCM challenges remain and constantly increase, influenced by various factors. Complexity theory provides new tools to local government to help to assist it in addressing its complex and challenges.

The study reveals that SCM is a solution to current challenges facing the public sector, as SCM adds value to public sector organisations. Senior and middle managers and SCM officials agree that SCM must be guided by a comprehensive legislative framework. In respect of this category, the study reveals that the current public sector SCM protocol causes certainty and efficiency given the integration of stakeholders.

The representative from the Office of the Auditor-General agrees with senior management on most of the statements, only differing in respect of the requirement that for the SCM approach to survive the complexities of local government it must exhibit creative and innovative behaviours within its system.

6.3 FINDINGS OF THE STUDY

A literature study and an empirical case study were conducted with the aim of achieving the research objectives and addressing the research problem outlined in Chapter 1. The research objectives along with their findings from the study are detailed below.

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6.3.1 To Determine the Effects of Complexity in Organisations on the Functioning of Supply Chain Management

The results reveal that local government as an organisation exhibits a complex character and systems and therefore complexity in the organisation influences its behaviour. The findings indicate that the organisation needs to understand its own complexity and adopt a flexible character to respond to the effects of its organisational uncertainty. This response will bring about necessary improvements in the local government system in realising enhanced service delivery. SCM in municipalities faces high levels of turbulence and uncertainty.

In line with the results of the study and the literature review, it is clear that municipalities are creatures of statute and are complex because of the nature of their systematic operations. Since complexity in the organisation influences its behaviour, and in order for the organisation to understand its complexity, it must understand its own functioning. Thus, it is recommended that local government adopts a survival, evolutionary and developmental approach and reviews its mandate and processes continuously to ensure that it addresses and deals with its complexity. Legislative reform that recognises, incorporates and addresses the complex nature of local government in general is also urgently required.

Literature on implementation of SCM in South Africa, including the 2015 Public Sector Supply Chain Management Review, confirms that municipalities experience major challenges in respect of the implementation of supply chain management. The framework on SCM was analysed and the elements which give rise to complexity of the supply chain management processes were identified. Two of these elements are demand management and acquisition management. Demand management is the planning process for supply chain management and acquisition. It is identified that the intricate nature of the systems operations within municipalities affects SCM efficiency. Complexity is about how the system and its subsystem function – the more intricate the system, the more complex the system is considered.

In relation to acquisition management, the market in which SCM sources its goods and services is considered volatile, uncertain, complex and ambiguous. SCM efficiency in such an environment requires some level of flexibility for which the supply chain policies, regulations and legislation falls short to provide.

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6.3.2 To Determine the Theoretical and Legislative Framework Pertaining to Supply Chain Management in South Africa, in Particular as Applicable to Local Government

The study confirms that the existing theoretical and legislative framework is adequate to address the research objectives of the study. In 2003, the Municipal Finance Management Act was introduced with the aim to secure sound and sustainable management of the financial affairs of municipalities and other institutions in the sphere of local government, to establish National Treasury norms and standards for the sphere and to provide for related matters. In 2005, in support of the Municipal Finance Management Act, the Municipal SCM Regulations were promulgated, enabling strategic and operational standard implementation.

The research reveals that constant changes to regulatory requirements indicate a crisis in the implementation and adaptation of SCM in local government. The study also reveals that the current legislative framework must be reflective of local government complexity, which will impact positively on the implementation of SCM.

In terms of the legislative framework, a recommendation is made that JB Marks Local Municipality and the National Treasury amend the local government legislation on SCM to ensure that the legislative framework addresses the complexity and challenges of local government. The constant changes to policies and the legislative framework are indicative of the complex nature of local government, and the constant changes create confusion and uncertainty. For SCM to survive the complexity of local government, its legislative framework must promote creative measures within the local government system.

6.4 CONCLUSION

The research identifies a crucial aspect in relation to the functioning of local government as it recognises a common challenge that cuts across all municipalities and is at the heart and centre of basic municipal service delivery. Local government reforms such as the Constitution (1996), the White Paper on Local Government (1998), New Local Government (2000), the local government financial reforms in 2003 and 2005 respectively, the 2009 Local Government Turnaround Strategy, the SALGA Working Group in respect of the King Code Report (2012), the Back to Basics Strategy (2014), proposals on reforms of SCM and many other initiatives

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prove that local government is not an easy organisation, as the impact of all initiatives has not impacted municipalities in numbers. Challenges also have a tendency to reinvent themselves. with municipalities that are well-performing suddenly turning to collapse.

This research indicates that municipalities are facing serious challenges and they could become dysfunctional if they fail to understand the nature of their problems and challenges. Municipalities are by their nature complex organisations, and their complexity must be understood prior to any intervention.

The literature review indicates and confirms that local government exhibits a complex character. Lissack (1999:10) posits that complexity has become the main work of the day, especially when problems arise in any situation and organisation. Every day voices in the mass media narrate a world in which complexity is rising and institutional order is dissipating; thus, managers must improve their decision making and search for innovative solutions.

Zimmerman (1999:2) claims that, although the application of complexity, science-inspired approaches in organisations is still in the early stages, evidence of leaders applying the ideas to general management and leadership, planning, quality improvement and new service development is present. Some application projects have generated positive results while others are still a work in progress. Complexity science promises to have an important impact on organisational performance.

In respect of legislation, the findings reveal that constant changes to legislation, regulations and directives indicate that national government is struggling to implement its legislative vision in local government. More legislative reforms are expected to address the main issues in local government, which mainly concern compliance in all respects, particularly performance management and SCM.

The research found that JB Marks Local Municipality is in a state of chaos. The municipality had a good track record until 2012 and since then has moved from bad to worse. This is largely informed by the compliance and SCM aspect and the fact that the once-well-performing JB Marks Local Municipality merged with one of the worst-performing municipalities in South Africa. The system that used to be functional has become dysfunctional, indicating that the complexity challenges of local government are affecting JB Marks Local Municipality.

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The SCM literature indicates that the chain stakeholders are at the heart of the supply chain and that in this regard local government is not anywhere close to achieving this central requirement. SCM is thus in the developmental stage within local government and far from being in the maturity stage.

In respect of legislation, it is important to recognise that local government legislation, in particular that intended to regulate SCM, is constantly under review. The current legislative framework does not fulfil its purpose and must be amended and constantly supported with regulations and national directives. SCM as theoretically conceived and delimited by legislation and policy directives has been proven to function optimally with extreme difficulty in organisations that exhibit complex characteristics, such as local government.

The case study reveals that, for SCM to succeed in local government, the complexity experienced must be factored into and addressed in legislation. SCM requires a high level of commitment, skills, capacity and understanding of supply chain objectives with a definite nexus existing between service delivery and SCM functioning. A middle ground must be found to ensure that SCM is viable within complex local government based on literature best practices, the legislative approach and structural reorganisation.

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REFERENCES

Agus, A. (2011). 'The structural influence of supply chain management on product quality and business performance'. *International Journal of Trade, Economics and Finance*, *2*(4), pp.268–271.

Ali, M. and Habib, M. (2012). 'Supply Chain Management of the Textile Industry: A case study on Bangladesh'. *International Journal of Supply Chain Management*, *1*(2), pp.35-40.

Allen, T. and Moses, J. (2001). *ESD Terms and Definitions (Version 12)*. Working paper series. Massachusetts Institute of Technology Engineering Systems Division.

Ambe, I.M. (2016). *Insight into Supply Chain Management in a Municipal Context*, *5*(2).

Ambe, I.M. and Badenhorst-Weiss, J.A. (2016). 'Supply chain management challenges in the South African public sector'. *African Journal of Business Management* [online], 6(44), pp.11003–11014. Available from https://doi.org/10.5897/AJBM12.360. [accessed 14 May 2018].

Anderson, A. (1999). 'Application of complexity theory to organisational science'. *Organisational Science*, *10*(3).

Axelrod, R.M. and Cohen, M.D. (1999). *Harnessing Complexity: Organizational Implications of a Scientific Frontier*. New York. Free Press.

Baker, P.L. (1993). *Chaos, Order, and Sociological Inquiry*, *63*(2), pp.123-149.

Bailey, K. (1990). *Social Entropy Theory*. Albany, New York. State University of New York Press.

Nathan, B. and Lemoine, J..2014. What VUCA Really Means for You (Jan/Feb 2014). Harvard Business Review, Vol. 92, No. 1/2, Available at SSRN: https://ssrn.com/abstract=2389563 date accessed 28-03-2019.

Ballou, R.H. (2007). 'The evolution and future of logistics and supply chain management'. *European Business Review*, *19*(4), pp.332-348.

Beinhocker, E.D. (1997). 'Strategy at the edge of chaos'. *The Mckinsey Quarterly*. *No. 1*.

Stellenbosch University https://scholar.sun.ac.za

Benbya, H. and McKelvey, B. (2016). 'Towards a complexity theory of information systems development'. *Information Technology and People*, *19*(1), pp.12-34.

Beeson, I., & Davis, C. (2000). Emergence and accomplishment in organizational change. *Journal of Organizational Change Management*, 13(2), 178-189.

Brown, S.L. and Eisenhardt, K.M. (1998). *Competing on the Edge: Strategy as Structured Chaos*. Boston, MA. Harvard Business School Press.

Byeon, J. (2005). 'A systems approach to entropy change in political systems'. *Systems Research and Behavioral Science*, *22*, pp.223-231.

Capps, C. and Hazen, S.E. (2002). 'Applying general systems theory to the strategic scanning of the environment from 2015 to 2050'. *International Journal of Management*, *19*(2), pp.308-314.

Cederman, L.E. (1997). *Emergent Actors in World Politics*. Princeton, NJ. Princeton University Press.

Chaitin, Gregory J. (1992). 'Information-Theoretic Incompleteness'. *Applied Mathematics and Computation*, *52*, pp.83–101.

Chopra, S. and Meindil, P. (2001). *Supply Chain Management: Strategy, Planning and Operation*. Prentice Hall.

Christopher, M. (1992). *Logistics and Supply Chain Management*. London. Pitman Publishing.

Christopher, M. (1992). *Logistics and Supply Chain Management.* New York. Pitman Publishing.

Cleveland, J. (1994). *Complexity Theory: Basic Concepts and Application to Systems Thinking.* Innovation Network for Communities.

Den Butter, F.A.G. and Linse, K.A. (2008). 'Rethinking procurement in the era of globalization'. *Operations Management and Research*, *50*(1), pp.76-80.

Stellenbosch University https://scholar.sun.ac.za

Dooley, K. (2002), "Organizational Complexity," International Encyclopedia of Business and Management, M. Warner (ed.), London: Thompson Learning, p. 5013- 5022.

Du Toit, D. and Vlok, P.J. (2014). 'Supply chain management: A framework of understanding'. *The South African Journal of Industrial Engineering*, *25*(3).

Drucker, P.F. (1998). *Practice of Management*. Oxford. Butterworth Heinemann.

Ellis, S.C., Shockley, J., and Henry, R.M. (2011) 'Making sense of supply disruption risk research: A conceptual framework grounded in enactment theory'. *Journal of Supply Chain Management*. [Online], *47*(2), pp.65–96. Available from: https://doi.org/10.1111/j.1745-493X.2011.03217. [accessed: 17-04-2018].

Farazmand, A. (2003). "Chaos and transformation theories: a theoretical analysis with implications for organization theory and public management". *Public Organization Review*, *3*(4), pp.339-372.

Farley, G.A., 1997. Discovering supply chain management: a roundtable discussion. APICS - The Performance Advantage 7 (1), 38-39

Ferreira, P. (2001). *Tracing Complexity Theory*. Research seminar in engineering systems.

Fitch, D. and Jagolino, N.C. (2012). 'Examining organisational functioning through the lens of complexity theory using systems dynamics modelling'. *Journal of Social Service Research*, pp.591-604.

Fourie, D.J. (2015), 'Procurement in the South African public service: A reflection of the ethical and legislative framework'. *Public and Municipal Finance*, *4*(2), pp.38–45.

Freeman, R.E. and Harrison, J.S. (2010). *Stakeholder Theory: The State of the Art.* Academy of Management Annals.

Gilbert, N. (2008). *Researching Social Life*, 3rd ed. London. Sage Publications Ltd.

Grinnell, R.M. and Unrau, Y.A. (2008). *Social Work Research and Evaluation: Foundations of Evidence-Based Practice*. New York. Oxford University Press.

Stellenbosch University https://scholar.sun.ac.za

Groban, G.M. (2005). ‘Complexity and diminishing returns in security’. *International Security*, *29*(1), pp.152-174.

Gunasekaran, A., Subramanian, N., and Rahman, S. (2015). 'Green supply chain collaboration and incentives: current trends and future directions', *Transportation Research Part E: Logistics and Transportation Review*, *74*(SI), pp.1-10.

Habib, M. (2011a). ‘An exploratory study of supply chain management for tertiary educational institutions’. 2011 IEEE International Technology Management Conference (ITMC), San Jose, California, USA.

Habib, M. (2014). *Supply Chain Management (SCM): Theory and Evolution Supply Chain Management - Applications and Simulations.* Bangladesh. American International University.

Habib, M. and Jungthirapanich, C. (2008). ‘An Integrated Framework for Research and Education Supply Chain for the Universities’. Graduate School of Information Technology, Assumption University, Bangkok, Thailand

Habib, M. and Jungthirapanich, C. (2010a). ‘An empirical research of educational supply chain for the universities’. The 5th IEEE International Conference on Management of Innovation and Technology, Singapore, E-ISBN: 978-1-4244-6566-8, Print ISBN: 978-1-4244-6565-1.

Hiett, P.J. 1999. Characterizing critical rules at the ‘edge of chaos’. Biosystems Volume 49, Issue 2 , Pages 127-142

Hoole, R. (2006). *Drive Complexity Out of Your Supply Chain*. Harvard Business School Newsletter, pp.3–5.

Houlihan, J. (1988), "International Supply Chains: A New Approach", *Management Decision* [online], *26*(3), pp.13-19. Available from: https://doi.org/10.1108/eb001493. [accessed: 1 May 2018].

Hugo W.M.J,, Badenhorst-Weiss J.A. & Van Biljon E.H.B. (2004). Supply chain management logistics in perspective. Pretoria: Van Schaik.

Stellenbosch University https://scholar.sun.ac.za

Jauhar, S.K. and Pant, M. (2016). 'Genetic algorithms in supply chain management: A critical analysis of literature'. *Indian Academy of Science*, *41*(9), pp.993-1017.

JB Marks Local Municipality (2018). Annual report 2017-2018. Klerksdorp. Arnold and Wessels Printers.

Keskinen, M. (2003). 'The Great Diversity of Livelihoods - Socio-economic survey of the Tonle Sap Lake'. *WUP-FIN Socio-economic Studies on Tonle Sap No. 8*, MRCS/WUP-FIN, Phnom Penh.

Kraljick, P. (1983). 'Purchasing must become supply management'. *Harvard Business Review*.

Kleab, K. 2017. Important of Supply Chain Management .*International Journal of Scientific and Research Publications.* Vol. 7, Issue 9,

Kumar, R. (2014). *Research Methodology. A Step by Step Guide for Beginners*, 4th Ed. London. Sage Publishers.

Laegaard, J. and Bindslev, M. (2006). *Organisational Theory*. Ventus Publishing and Bookboon.

Lambert, D.M., Cooper, M.C., and Pagh, J.D. (1998). 'Supply Chain Management Implementation Issues and Research Opportunities'. *The International Journal of Logistics Management*, *11*(1), pp.1-17.

Lambert, D.M., Stock, J.R., and Ellram, L.M. (1998). *Fundamentals of Logistics Management*. Boston, MA. Irwin/McGraw-Hill.

Lewin, A.Y. (1999). 'Application of complexity theory to organisational science''. *Organisational Science*, *10*(3).

Lissack, M.R. (1999). *Complexity: The Science, its Vocabulary, and its Relation to Organisations*, *1*(1), pp.110-126

Luhmann, N. (1995) Social Systems, translated by J. Bednarz and D. Baecker, Stanford Press, Stanford CA

Stellenbosch University https://scholar.sun.ac.za

Mafini, C.2016. Barriers to public supply chain management strategy implementation: an exploratory diagnosis. Problems and Perspectives in Management, Volume 14, Issue 3, p.p.256-265

Manson, S. (2001). 'Simplifying Complexity'. *Geoforum, 32*(3), pp.405-414.

Matolong, M.J. (2015). *Guideline for Establishing an Effective Supply Chain Management Framework for Local Municipalities.* Mini-dissertation submitted in partial fulfilment of the requirement for the degree Master of Business Administration at the North-West University, Potchefstroom Campus.

Marion, R. (1999). *The Edge of Chaos*. Thousand Oaks, CA. Sage.

Mason, M. (2008a). *Complexity theory and the philosophy of education*. Willey, UK. Blackwell.

Mason, M. (2008b). 'What is complexity theory and what are its implications for educational theory?'. *Educational Philosophy and Theory, 40*(1), pp.35-49. Taylor & Francis.

Mason, R. (2007). 'The external environment's effect on management and strategy: A complexity theory approach'. *Management Decision*, *45*(1), pp.10-28.

Mathews, K.M., White, C.M., and Long, R.G. (1999a). The problem of prediction and control in theoretical diversity and the promise of the complexity science. *Journal of Management Inquiry*, *8*, pp.17-31.

Mathews, K.M., White, C.M., and Long, R.G. (1999b). 'Why study the complexity sciences in the social sciences?'. *Human Relations*, *52*(4).

McKenzie, C. and James, K. (2004). 'Aesthetic as an aid to understanding complex systems and decision judgement in operating complex systems'. *Emergence: Complexity & Organizations*, Special Double Issue, *6*(1-2), pp.32-39

McElroy, M.W. (2000). 'Integrating complexity theory, knowledge management and organization learning'. *Journal of Knowledge Management*, *4*(3), pp.195-208.

Stellenbosch University https://scholar.sun.ac.za

Mentzer, J.T., DeWitt, W., Keebler, J.S., Min, S., Nix, N.W., Smith, C.D and Zacharia, Z.G. (2001). 'Defining supply chain management'. *Journal of Business Logistics*, *22*(2).

Mhelembe, K. and Mafini, C. (2019). 'Modelling the link between supply chain risk, flexibility and performance in the public sector'. *South African Journal of Economic and Management Sciences* [online], 22(1). Available from: https://doi.org/10.4102/sajems.v22i1.2368 [accessed: 20 February 2020].

Migiro, S.O. and Ambe, I.M. (2008). 'Evaluation of the implementation of public sector supply chain management and challenges: A case study of the central district municipality, North-West Province, South Africa'. *African Journal of Business Management*, *2*(12), pp. 230-242.

Morel, B. and Ramanujam, R. (1999). 'Through the Looking Glass of Complexity: The Dynamics of Organizations as Adaptive and Evolving Systems'. *Organization Science*, 10(3), Special Issue: Application of Complexity Theory to Organization Science. (May - Jun., 1999), pp. 278-293.

Morrison, K. (2002). *School Leadership and Complexity Theory*. London. Routledge.

Morrison, K. 2008. Educational Philosophy and the Challenge of Complexity Theory. *Routledge* Volume 40, Issue 1. PP. 19-34

Municipalities South Africa. (n.d.). [Online]. Available from: https://municipalities.co.za/demographic/1246/jb-marks-local-municipality. [accessed: 24 September 2018].

New, S.J., Payne, P., 1995. Research frameworks in logistics: three models, seven dinners and a survey. *International Journal of Physical Distribution and Logistics Management* 25 (10), 60 -77.

Peristeris, O., Kilbourn, P.J. & Walters, J., 2015, 'Benchmarking supply chain management practices in a South African confectionery manufacturing organisation', *Journal of Transport and Supply Chain Management 9*(1), Art. #179, 10 pages

Prigogine, I. and Stengers, I. (1984). *Order Out of Chaos: Man's New Dialogue with Nature.* New York. Bantam Books.

Stellenbosch University https://scholar.sun.ac.za

Price, I. (2004). 'Complexity, complicatedness and complexity: a new science behind organizational intervention?'. *Emergence: Complexity & Organizations*, Special Double Issue, *6*(1-2), pp.40-48

Reason, P. and Goodwin, B.C. (1999). 'Towards a science of qualities in organisations: Lessons from complexity theory and postmodern biology'. *Concepts and Transformation*, *4*(3), pp.281-317.

Republic of South Africa. (1970). *National Suppliers Procurement Act (No. 89 of 1970)*. Pretoria. Government Printer.

Republic of South Africa. (1974). *Health Professions Act (No. 56 of 1974)*. Pretoria. Government Printer.

Republic of South Africa. (1999). *Public Finance Management Act 1*. Pretoria. Government Printer.

Republic of South Africa. (1996). *Constitution of the Republic of South Africa*. Pretoria. Government Printer.

Republic of South Africa. (1998a). *Administrative Adjudication of Road Traffic Offences Act (No. 46 of 1998)*. Pretoria. Government Printer.

Republic of South Africa. (1998b). *State Information Technology Agency Act (No. 88 of 1998)*. Pretoria. Government Printer.

Republic of South Africa. (1999). *Road Traffic Management Corporation Act (No. 20 of 1999)*. Pretoria. Government Printer.

Republic of South Africa. (2000a). *Construction Industry Development Board Act (No. 38 of 2000)*. Pretoria. Government Printer.

Republic of South Africa. (2000b). *Local Government Systems Act (No. 32 of 2000)*. Pretoria. Government Printer.

Republic of South Africa. (2000c). *Preferential Procurement Policy Framework Act (No. 5 of 2000)*. Pretoria. Government Printer.

Stellenbosch University https://scholar.sun.ac.za

Republic of South Africa. (2000d). *Promotion of Access to Information Act (No. 2 of 2000).* Pretoria. Government Printer.

Republic of South Africa. (2000e). *Promotion of Administrative Justice Act (No. 3 of 2000).* Pretoria. Government Printer.

Republic of South Africa (2000f). Reconstruction and Development Programme. Pretoria. Government Printers.

Republic of South Africa. (2002). *Disaster Management Act (No. 56 of 2002).* Pretoria. Government Printer.

Republic of South Africa. (2003a). *Armaments Corporation of South Africa Limited Act (No. 51 of 2003).* Pretoria. Government Printer.

Republic of South Africa. (2003b). *Broad-Based Black Economic Empowerment Act (No. 53 of 2003).* Pretoria. Government Printer.

Republic of South Africa. 1997. The Housing Act, No. 107 of 1997. Pretoria. Government Printers.

Republic of South Africa. (2003c). *Local Government Municipal Finance Management Act (No. 56 of 2003).* Pretoria. Government Printer.

Republic of South Africa. (2005). *Local Government Municipal Finance Management Act of 2003. Municipal Supply Chain Management Regulation*. Pretoria. Government Printer.

Republic of South Africa. (2004a). *Prevention and Combating of Corrupt Activities Act (No. 12 of 2004).* Pretoria. Government Printer.

Republic of South Africa. (2004b). *Public Audit Act (No. 25 of 2004),* Pretoria. Government Printer.

Republic of South Africa. (2005). *Nursing Act (No. 33 of 2005).* Pretoria. Government Printer.

Republic of South Africa. (2009a). *Financial Management of Parliament Act (No. 10 of 2009).* Pretoria. Government Printer.

Stellenbosch University https://scholar.sun.ac.za

Republic of South Africa. (2009b). *National Land Transport Act (No. 5 of 2009)*. Pretoria. Government Printer.

Republic of South Africa (2015). *National Treasury 2015 Public Sector Supply Chain Management Review*. Pretoria. Government Printer.

Rihani, S. (2002). *Complex Systems Theory and Development Practice*. London. Zed Books.

Rhee, Y. (2000). 'Complex systems approach to the study of politics'. *Systems Research and Behavioral Science, 17*(6), pp.487-491.

Santonus, M. (1998). *Simple, Yet Complex*. [Online]. Available from: http://www.cio.com/archive/enterprise/041598qandacontent.html [accessed: 10 November 2000]

Schneider, M. and Somers, M. (2006) 'Organizations as complex adaptive systems: implications of complexity theory for leadership research', The Leadership Quarterly, Vol. 17, No. 4, pp.351–65.

Scott, C. and Westbrook, R. (1991). 'New strategic tools for supply chain management'. *International Journal of Physical Distribution and Logistics Management, 21*(1), pp.23-33.

Stacey, R.D. (1992). *Managing the Unknowable*. San Francisco. Jossey-Bass.

Sullivan, T. (2004). 'The viability of using various system theories to describe organizational change'. *Journal of Educational Administration, 42*(1), pp.43-54.

Stock, J. and Boyer, S. (2009). 'Developing a consensus definition of supply chain management: a qualitative study'. *International Journal of Physical Distribution & Logistics Management, 39*(8), pp.690-711.

Sherif, K. (2006). An adaptive strategy for managing knowledge in organisations. *Journal of Knowledge Management, 10*(4), pp.72-80.

Smykay, E.W., Bowersox, D.J., and Mossman, F.H. (1961). *Physical Distribution Management: Logistics Problems of the Firm*. New York. Macmillan Publishers.

Stellenbosch University https://scholar.sun.ac.za

Snyder, J. and Jervis, R (eds.) (1993). *Coping with Complexity in the International System*. Boulder, CO. Westview Press.

Stevenson, M. and Spring, M. (2007). 'Flexibility from a supply chain perspective: Definition and review'. *International Journal of Operations and Production Management*, *27*(7), pp.685-713.

Styhre, A. (2002). 'Non-linear change in organizations: organization change management informed by complexity theory'. *Leadership & Organization Development Journal*, *23*(6), pp.343-351.

Tukamuhabwa, B.R., Stevenson, M., Busby, J., and Zorzini, M. (2015) 'Supply chain resilience: definition, review and theoretical foundations for further study'. *International Journal of Production Research*, *53*(18), pp.5592-5623, DOI: 10.1080/00207543.2015.1037934

Tang, C. and Tomlin, B. (2008). 'The power of flexibil-ity for mitigating supply chain risks'. *International Journal of Production Economics*. DOI:10.1016/j.ijpe.2008.07.008

Tassabehji, R. and Moorhouse, A. (2008). 'The changing role of procurement: Developing professional effectiveness'. *Journal of Purchasing and Supply Management*, *14*(1), pp.55-68.

Terre Blanche, M., Durrheim, K. and Painter, D. (2012). *Research in Practice – Applied Methods for the Social Science*, 2nd ed. Cape Town. UCT Press.

Van der Waldt, G. (2014). 'Implementation challenges facing Performance Management Systems in South African Municipalities: Selected cases'. Administration Public, *22*(2), pp.132-152

Wacker, C.O. (2016). 'Supply management and procure as a South African FMCG company: A practical approach of developing a decision support tool for managing direct material cost'. Unpublished master's thesis.

Walby, S. (2007). *Globalization and Complex Inequalities*. London: Sage.

Waldrop, M. M. (1992) Complexity: The emerging science at the edge of order and chaos. Harmondsworth: Penguin.

Stellenbosch University https://scholar.sun.ac.za

Waterman Jr., R.H., Peters, T.J., and Phillips, J.R. (1980). 'Structure is not organization'. *Business Horizons*. *23*(1), pp.14-26

Wei, Z. and Xiang, W. (2013). 'The importance of supply chain management'. *International Journal of Business and Social Science*, *4*(16).

White, L. (2000). "Changing the "whole system" in the public sector". Journal of Organizational Change Management, 13(2), 162-177.

Yoon, S., and K. P. Kuchinke. (2005). "Systems theory and technology. Lenses to analyze an organization". Performance Improvement, 44(4), 15-20.

Zimmerman, B. (1999). 'Complexity science: A route through hard times and uncertainty'. *Health Forum Journal*, pp.42-69.

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ANNEXURES

ANNEXURE A: CONSENT TO PARTICIPATE IN A RESEARCH STUDY

This form serves as consent to participate in the completion of a questionnaire towards a master's degree in public administration. The study is titled 'Supply Chain Management in Complex Organisations: A case study of JB Marks Local Municipality'.

Declaration

I herewith give consent that I will voluntary participate in this study through the completion of a questionnaire. I have been informed by the researcher that my feedback will remain anonymous and that the information provided will be applied for research purposes only. I have also been informed that feedback obtained through the questionnaire will be treated as collective feedback and that no individual will be identified or implied in the study.

_____ _____

Signature **Date**

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ANNEXURE B: QUESTIONNAIRE

This questionnaire serves as the data-collection instrument for a thesis towards a Master's degree in Public Administration at the Stellenbosch University School of Leadership and Governance. The study is titled 'Supply Chain Management in Complex Organisations: A case study of JB Marks Local Municipality'. The aim of this questionnaire is to solicit input from participants within JB Marks Municipality with regard to the effective functioning of supply chain management.

Instructions to participants

The questionnaire comprises two sections: Section A and Section B.

Section A

This section concerns the biographical information of respondents and should be completed by all participants.

Section B

This section deals with the supply chain management practices and the complexity in JB Marks Municipality and is divided into six categories (A, B, C, D, E and F) according to the various employment levels in the municipality. Please complete only the category in Section B that is relevant to your employment level.

Category A: To be completed by senior and middle management (levels 0-6)

Category B: To be completed by employees on levels 8-10

Category C: To be completed by municipal councillors

Category D: To be completed by all participants

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Category E: To be completed by community members

Category F: To be completed by the Office of the Auditor-General

SECTION A: BIOGRAPHICAL INFORMATION OF ALL PARTICIPANTS

Mark the corresponding box with an X.

Employment level	**Level 0-6**	**Levels 8-10**	**Other participant**	**Community member**	**Municipal councillor**

Experience	**0-5 Years**	**6-10 Years**	**0-5 Years**	**11-15 Years**	**15+ Years**

Qualifications	**Matric and below**	**Diploma**	**Bachelor's degree NQF 7-8**	**Postgraduate NQF 8**	**Postgraduate NQF 9**	**Postgraduate NQF 10**

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Title : Category A: To be completed by senior and middle management (levels 0-6)

Part 1

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
As part of the management of JB Marks Local Municipality, I have a comprehensive understanding of the supply chain and supply chain management.					
The supply chain comprises a network of organisations that are involved upstream and downstream of resource usage.					
The supply chain and supply chain management approach is a private sector approach.					
Currently, the public sector supply chain and supply chain management are in the developmental phase.					
Currently, the public sector supply chain and supply chain management are in the maturity phase.					
Current local government procurement procedures are seeking to achieve the best possible results at the best possible cost with the best possible quantity and quality in order to achieve the objectives as set out in the Constitution.					
Currently, public sector organisations handle the procurement of goods and services within a network of organisations through upstream and downstream linkages with various processes and activities that produce goods and services.					

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Currently, the supply chain and supply chain management are relevant and create value.					
Factors external to local government are impacting on the optimal functioning of supply chain management.					
Supply chain management requires a high level of commitment, skills, capacity and understanding of the supply chain objective.					
Supply chain management requires constant adjustment to its founding legislative framework to ensure that it addresses all unanticipated changes.					

Part 2

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
VUCA (volatility, uncertainty, complexity and ambiguity) describes the world today.					
The VUCA environment requires more nuanced thinking.					
Local government is operating near a threshold of instability.					
Conditions in local government are constantly changing.					
In order for local government to remain relevant, it must adopt survival, evolutionary and developmental approaches and should review its mandate and processes continuously.					

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Part 3

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
Current public legislation is sufficient for the implementation of supply chain management.					
A need for changes to the current legislative framework exists.					
The National Treasury's constant changes to legislation indicate a crisis in the implementation of supply chain management.					
A legislative framework reflective of local government complexities will enhance the implementation of supply chain management.					
The supply chain management legislative framework is understood to consist of two broad focus areas, namely the establishment of a framework for governance principles in the procurement of goods and services and the introduction of the preferential system aimed at addressing the socioeconomic objectives.					

Title: Category B – To be completed by employees on levels 8-10

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
A supply chain management emphasis is a solution to the current public sector challenges.					
Supply chain management adds value to public sector organisations.					
Supply chain management reduces cost, facilitates information sharing and eliminates duplication.					
Understanding of supply chain management is linked to compliance with a legislative framework only.					

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Understanding of supply chain management is linked to the legislative framework and related literature explaining the intentions, processes and techniques.					
The current public sector supply chain management protocol causes certainty and efficiency, given the integration of actions of various stakeholders, for example suppliers, regulators, SCM staff and users of resources.					

Category C: To be completed by municipal councillors

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
Supply chain management adds value.					
Complexity in the organisation influences its behaviour.					

Category D: To be completed by all participants

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
Local government exhibits a complex character and system.					

Category E: To be completed by community members

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
Improper management of procurement/supply chain management is the main reason for service delivery failure in local government.					
Improvement of the local government procurement system will enhance service delivery to its constituent beneficiaries.					

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Category F: To be Completed by the Office of the Auditor-General

Part 1

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
The supply chain is about the flow of goods and services from raw to finished goods with interaction among different role players who influence the final product, making single-point accountability impossible.					
The supply of goods and services through a chain must be assessed as a single process.					
In order for the supply chain management approach to survive the complexities of local government, it must exhibit creative and innovative behaviours within its total system.					

Part 2

Statement	Fully Disagree	Disagree	Uncertain	Agree	Fully Agree
VUCA (volatility, uncertainty, complexity and ambiguity) describes the world today.					
The VUCA environment requires more nuanced thinking.					
Local government operates near a threshold of instability.					
Flexibility is required to respond to the uncertainty effect.					
Local government is near entropy of equilibrium.					
Complexity is identified through the relationships among systems rather than their constituent parts.					
In order for an organisation to understand its own complexity, it must understand its own functioning.					

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ANNEXURE C: PERMISSION TO CONDUCT RESEARCH IN JB MARKS LOCAL MUNICIPALITY

21 December 2017

MUNICIPAL MANAGER
Dr. NE Blaai-Mokgethi
JB Marks Local Municipality
P.O. BOX 113
POTCHEFSTROOM

PERMISSION TO CONDUCT RESEARCH STUDY: SUPPLY CHAIN MANAGEMENT IN COMPLEX ORGANISATIONS.

I am writing to request permission to conduct a research study at your institution, JB Marks local Municipality. I am currently enrolled for the degree- Master Public Administration at the University of Stellenbosch.

The study is entitled: **Supply Chain Management in Complex Organisations: The case study of the JB Marks Local Municipality.**

The research results will be pooled for the thesis project and individual results of this study will remain absolutely confidential and anonymous. Should this study be published, only pooled results will be documented.

Your approval to conduct this study will be greatly appreciated.

Kindest regards

Z'nakile Maila
Research student: Stellenbosch University

APPROVED / ~~NOT APPROVED~~

Comments :

Permission has been granted.

---

pp

DR. NE BLAAI-MOKGETHI
MUNICIPAL MANAGER

22/12/2017
DATE

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Jaclyn Woods editing services

074 717 2508 | jaclynwds@gmail.com | PO Box 875, Howard Place, 7450

24 March, 2020

PO Box 875
Howard Place
7450

To whom it may concern,

This letter stands as testament that I, Jaclyn Woods, edited the research paper of Z'nakile Maila. The subject of this paper was *Supply Chain Management in Complex Organisations: A Case Study of JB Marks Local Municipality*.

Please feel welcome to reach out to me with any questions.

Yours sincerely,

Jaclyn Woods
074 717 2508
jaclynwds@gmail.com

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TAALSENTRUM
LANGUAGE CENTRE
IZIKO LEELWIMI

UNIVERSITEIT
STELLENBOSCH
UNIVERSITY

25 October 2019

Mr Z'nakile Maila
3 Rossini Street
van Der Hoff Park
Potchefstroom
2531

Dear Mr Maila

EDITING OF THESIS

The Stellenbosch University Language Centre hereby confirms that in July 2019 we edited your thesis comprehensively. MS Word's track changes function has been used and the edited thesis was delivered to you on 2 August 2019.

Please contact me should you have any queries.

Regards

Marguerite van der Waal
Head: Language Service
Steilenbosch University Language Centre
Tel: 021 808 3096
Fax: 021 808 2863
E-mail: mvdwaal@sun.ac.za